NORTHROP NEWS

VENTURA

VOLUME XXIII

NORTHROP NEWS

NORTHROP VENTURA

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Marketing, Planning Strengthened

A number of important changes have taken place over the past few weeks in the functions and responsibilities of key officers and executives of the company in the Beverly Hills offices concerned with developing new marketing opportunities.

A new alignment establishes in the company's headquarters an integrated corporate marketing function under Corporate Vice-president Glenn R. Lord and a corporate forward planning function under Corporate Vice-president Ward B. Dennis, both of whom report directly to the president.

Mr. Jones and other company officers are convinced that the next few years will offer expanding, worldwide opportunities for Northrop, and these moves will strengthen our ability to identify and take full advantage of them.

The program of restructuring these corporate office functions was thoroughly worked out with the division general managers and is designed to produce a hard-hitting, fast-reacting corporate organization that can bring all of the company's resources to bear in the support of each division's planning and marketing efforts.

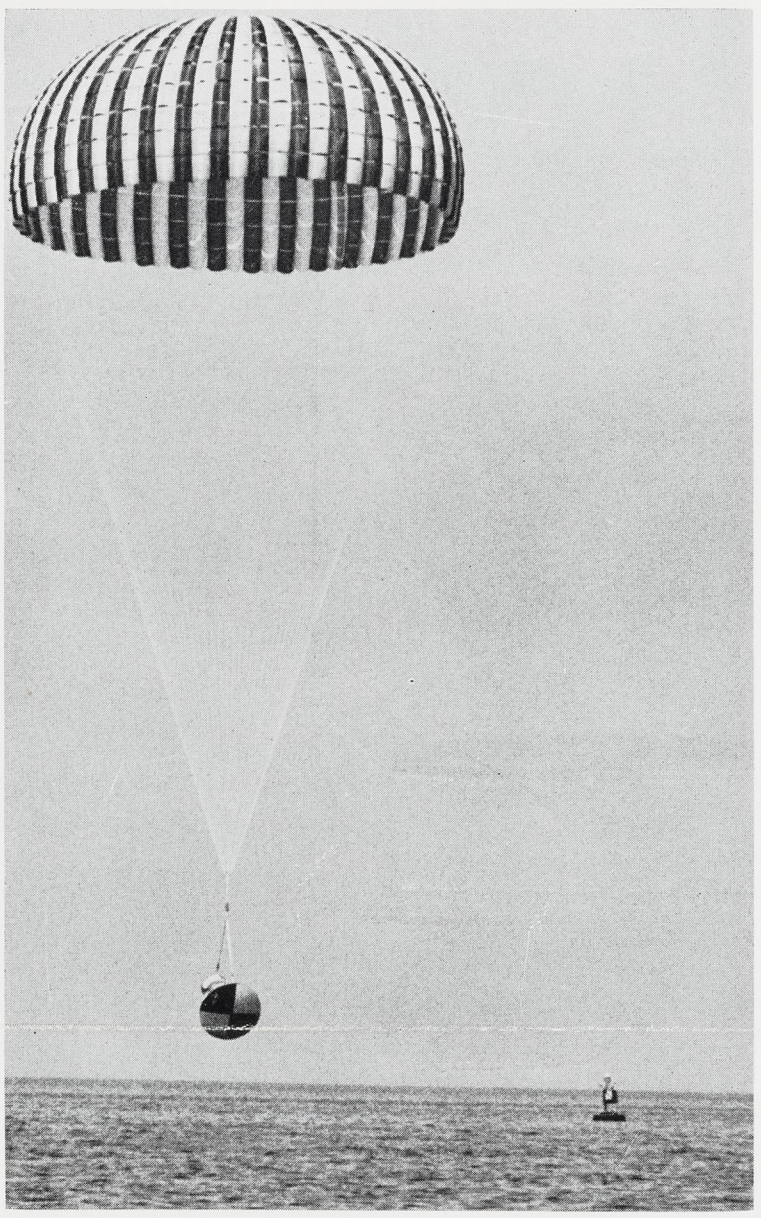
Broadly speaking, there is no change in the authority and re-

(See CORPORATE, Page 6)

ARMY AWARDS DRONE CONTRACT

Ventura Division has been awarded a $903,000 contract by the U.S. Army for continued production of AQM-38A (RP-76) rocket power target missiles.

The air-launched supersonic target has been used since 1959 by the Army to provide practice for crews operating Nike and Hawk anti-aircraft missile batteries in the U.S. and overseas.



LANDING, VENTURA STYLE—A full-scale boilerplate Gemini spacecraft approaches the surface of the Salton Sea (Calif.) during an air drop test of the parachute landing system produced for NASA's two-man space flight program by Northrop Ventura. The 84-foot-diameter parachute compares with the 63-foot chute used for astronaut recovery during the Mercury program.

VENTURA DIVISION SCORES 10th HIT IN GEMINI TESTS

The flight test qualification program for the Project Gemini parachute landing system was completed successfully at El Centro, February 11, nearly a month and four flight tests ahead of schedule.

The drop from an Air Force plane flying at 17,000 feet altitude was the 10th consecutive successful test of the complete recovery system which will be used in the two-man Gemini space flights beginning this spring. The final two tests simulated emergencies in which the high-altitude drogue stabilization parachute did not deploy or failed after deployment.

Originally 14 flight tests had been scheduled by the National Aeronautics and Space Administration at the joint Parachute Test Facility, El Centro, to prove out the final landing system. However, due to the full success of the earlier tests, the four final flights were cancelled. The original target date for completion of the series had been early March.

The Gemini landing system is produced by Northrop Ventura under contract to McDonnell Aircraft Corporation, principal spacecraft contractor.

Preceding the series of 10 full system tests, the Gemini landing system had undergone 57 additional air drop tests during the

(See GEMINI, Page 6)

NORTHROP NEWS MAKES DEBUT IN THREE EDITIONS

The NORTHROP NEWS makes its debut today.

Intended to provide a medium for communication throughout the large, diversified corporation, the paper will be published in three editions.

Two Hawthorne neighbors, Norair Division and Northrop Space Laboratories, will share one edition.

Nortronics and Ventura Divisions each will be covered in individual editions.

The NORTHROP NEWS will be published biweekly for and by employees of Northrop and will be devoted to providing all employees with information of mutual interest concerning the company.

Charles Bradford, who has been with the company 22 years, has been named editor.

Astronaut Sets Visit to Ventura

Astronaut Charles Bassett will visit Ventura Division May 3, it has been announced by the National Aeronautics and Space Administration.

He will be at the Conejo Valley facility for technical discussion and to meet personnel working on both the Gemini and Apollo projects, NASA said.

F-5 Squadron Delivered to Iran

First overseas delivery of Northrop F-5 tactical fighters was completed early this month at Tehran, Iran, in ceremonies attended by U.S. diplomats and military advisors, key officers of the Imperial Iranian Air Force and a Northrop team headed by Chairman and President Thomas V. Jones.

The historic initial delivery consisted of a squadron of 13 supersonic F-5s.

A highlight of the event was the announcement by U.S. Ambassador Julius C. Holmes that this first squadron of Hawthorne-built fighters was the forerunner of a total of seven squadrons that would be delivered to Iran.

In praising the F-5 performance, Ambassador Holmes added that Norway, Korea, the Republic of the Philippines, Turkey, Greece, Spain and Nationalist China also will receive the aircraft.

Northrop's Norair Division, which manufactures the aircraft at its Hawthorne facility, developed the F-5 in a three-year program for the Defense Department.

The planes were turned over to Iran as part of a mutual security program which, over a period of 15 years, has provided $650 million U.S. aid to Iranian defense.

Highlighting this month's ceremony was the removal of temporary U.S. Air Force insignia from the planes to reveal the permanent insignia of the Iranian Air Force.

INTERNATIONAL EXCHANGE—Warm handshakes between Lt. General Mohammad Khatami, commander of the Imperial Iranian Air Force, and Thomas V. Jones, Northrop chairman and president, precedes delivery of F-5 squadron to Iran. Ceremonies this month at Tehran, Iran, marked initial overseas delivery of F-5.

Apollo Landing System Passes Severest Test

The landing system which will return Apollo astronauts to earth after their voyage to the moon has passed its severest test at the Army's White Sands Missile Range near Las Cruces, New Mexico.

Developed and manufactured by Ventura Division, the system is undergoing further checkouts this month at El Centro, California, in preparation for a scheduled 1966 voyage.

In the White Sands test, conducted by the National Aeronautics and Space Administration, a rocket carrying the five-ton Apollo command module was destroyed in order to simulate explosion of the Apollo booster during launch or early flight.

Escape rockets carried the module free of the exploding booster, and the parachute landing system took control to lower the vehicle gently to earth.

The test, which used a Little Joe II rocket to lift the module 50,000 feet, was the most difficult and complex of three flights conducted to date at White Sands.

At El Centro the continuing experiments involve air drops from Air Force cargo planes at

(See APOLLO, Page 6)

Northrop Spans Broad Aerospace Spectrum

Manager of Technologies; Sciences For Free World

If someone should ask what Northrop makes, an employee would be right in telling him—within the limits of security—the name of some products of his job or division. But to be fully correct, something like this should be added:

"We also design and build gyroscopes; accelerometers; sun, earth, and moon sensors; computers; star trackers; missile and aircraft guidance systems; lenses and precision optical and optical/electronic equipment; ordnance and countermeasures devices; electronic checkout equipment; space vehicles; life support systems and equipment; spacecraft recovery systems; target and surveillance drone aircraft; antennas; communications systems; ships' inertial navigation systems; supersonic fighter and trainer airplanes; undersea cable systems; commercial and residential architectural aluminum door frames, window walls, and sunshade control systems."

In addition, the company engages in research and development in many other technologies, ranging from aerodynamics to zero gravity.

The Corporate capabilities brochure puts it this way: "Northrop Corporation is a diversified, systems-oriented company engaged in the research, development, and production of advanced scientific and technological products for Free World defense and space programs."

Northrop does this both as a prime systems manager and as a major subcontractor in various national programs.

This is where Northrop draws its distinction. The Company is, in short, a manager of technologies in fields that are in the forefront of national progress and security.

The structure the Company employs to manage its many technologies consists of four divisions, the space laboratories organization, three wholly-owned subsidiaries, and several affiliate companies and joint ventures. The organizations are all solidly built around fundamental technical capabilities, rather than product lines.

Northrop plants and facilities occupy more than five million square feet of floorspace in five states and the District of Columbia. Key overseas offices are in Paris and Tokyo. The Company currently employs more than 16,000 men and women and has approximately 80 significant programs and projects in work.

Norair: The Largest

Northrop Norair, with headquarters in Hawthorne, California, where the original Company was founded in 1939, is the largest division. It is a specialist organization for manned aircraft, aeronautical systems, and missile airframes and systems.

Among the major products of the division today are the T-38 Talon supersonic jet trainer and the F-5 tactical fighter. Capable of operating from short, unprepared fields in forward battle areas, the F-5A can carry 6200 pounds of bombs, weapons and extra fuel or an equal weight of reconnaissance and surveillance equipment on a variety of missions. Its top speed is approximately 1000 statute mph.

A two-seat version, the F-5B, provides the same weapons delivery capability and has virtually the same performance characteristics. In addition, the F-5B can be utilized for maintaining pilot proficiency, for student pilot and combat training.

More than 500 T-38's are now in service with the Air Training Command with nearly a dozen more being added every month. The T-38 Talon trainer gives student pilots experience in all aspects of supersonic, multi-jet, and high altitude flight in a combat aircraft environment.

In the area of lifting re-entry research vehicles, Northrop Norair has been selected by NASA's Flight Research Center at Edwards Air Force Base to design and fabricate two low-speed lifting-body gliders—designated M-2 and HL-10—for use in investigating problems of piloting advanced spacecraft during re-entry and landing.

Five separate laboratories at Northrop Norair provide research support for studies leading to aircraft and missile concepts of the future. The labs are designed for vehicle flight dynamics, communications and radar, structural dynamics, thermo structures, and vehicle flight controls.

Nortronics: Diversification

Most diversified of all Northrop divisions in terms of products is Northrop Nortronics, headquartered in Palos Verdes, Calif. There also, as well as in Hawthorne, is the division's research laboratories organization. The latter group performs research, development, and production of inertial and astro-inertial guidance and navigation systems, computers, real time information display systems up to theater size, optical tracking systems, star trackers, voice communication and warning systems, space vehicle attitude control systems, air data sensors, and associated electronic components.

Among other products in these areas are the movable "Q-Ball" attitude sensor in the nose of the X-15 rocket research plane, and the fixed version of the air data sensor in the nose of Saturn space boosters. The division also built sun and earth sensors carried on the Mariner past Venus and the guidance and navigation equipment which guided Ranger to the moon.

Nortronics maintains a research and production facility at Anaheim, California, for electronic test and checkout equipment; optical/electronic viewers and equipment; countermeasures devices and ordnance. The Anaheim facility contains equipment that gives it the largest precision lens-grinding capability in the West.

PPD: New Frontier Land

Northrop Nortronics' facilities stretch across the continent to Massachusetts. The Precision Products department in Norwood is one of the foremost producers of precision gyroscopes in the world. As well as building inertial packages for aircraft, missiles, ships, and submarines, it conducts research in such advanced areas as miniature gas spin bearings and radiometry.

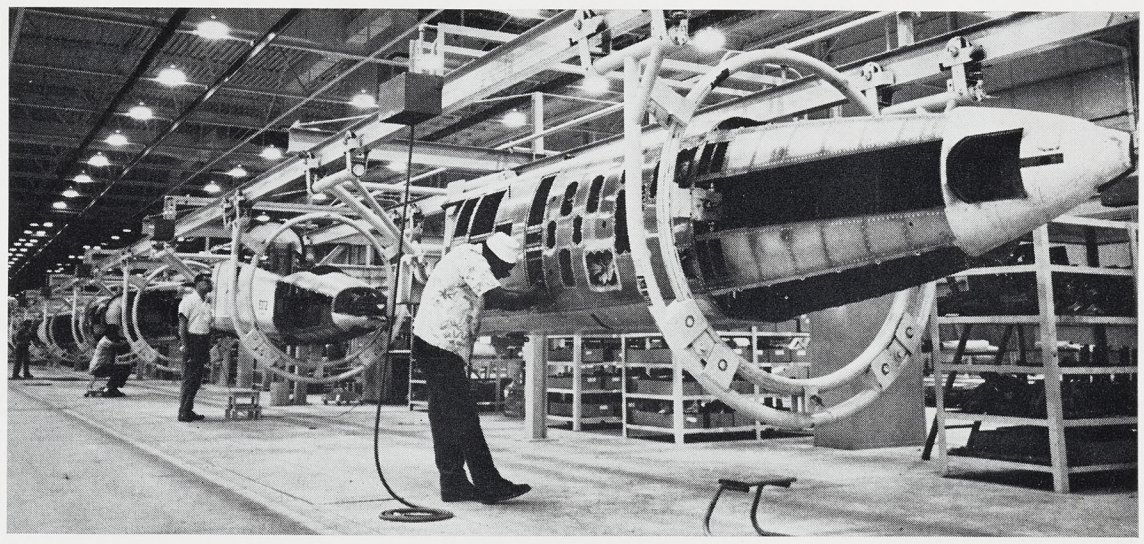
MED: Systems Specialist

Nortronics' Marine Equipment department in Needham Heights, Massachusetts, specializes in control, navigation, stabilizing, communication, and detection systems and equipment for all types of shipboard use. It works on a larger scale in the production of tracking mounts, pedestals, and directors such as the mount it built last year for a 3500-pound laser telescope system for NASA.

Ventura: On Target

Approximately 50 miles northwest of Los Angeles in California's Ventura County, Northrop Ventura is a major producer of

(See CAPABILITIES, Page 5)



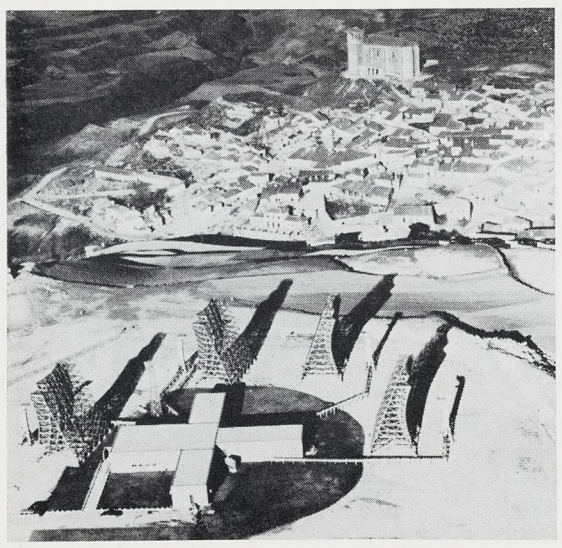
MICE AND MEN

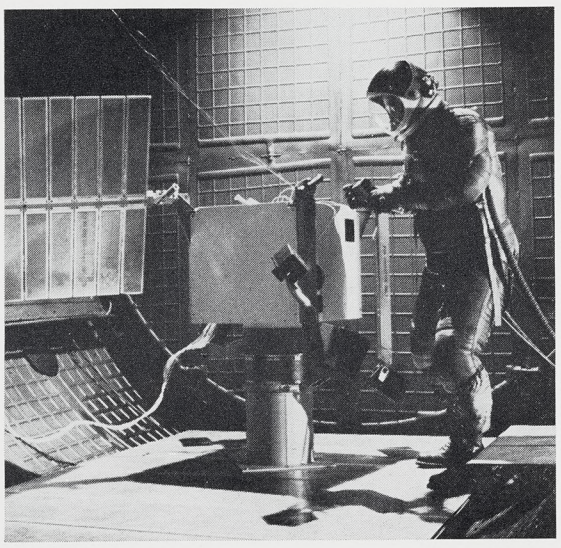
Tiny pocket mice able to withstand huge radiation doses are subjects of biological studies in Life Sciences Division of Northrop Space Laboratories. Unique rail production line (above) for F-5/T-38 assembly at Norair is giant step forward in building man-carrying supersonic aircraft, another Northrop capability.

The Corporate View: Covering 14 Nations

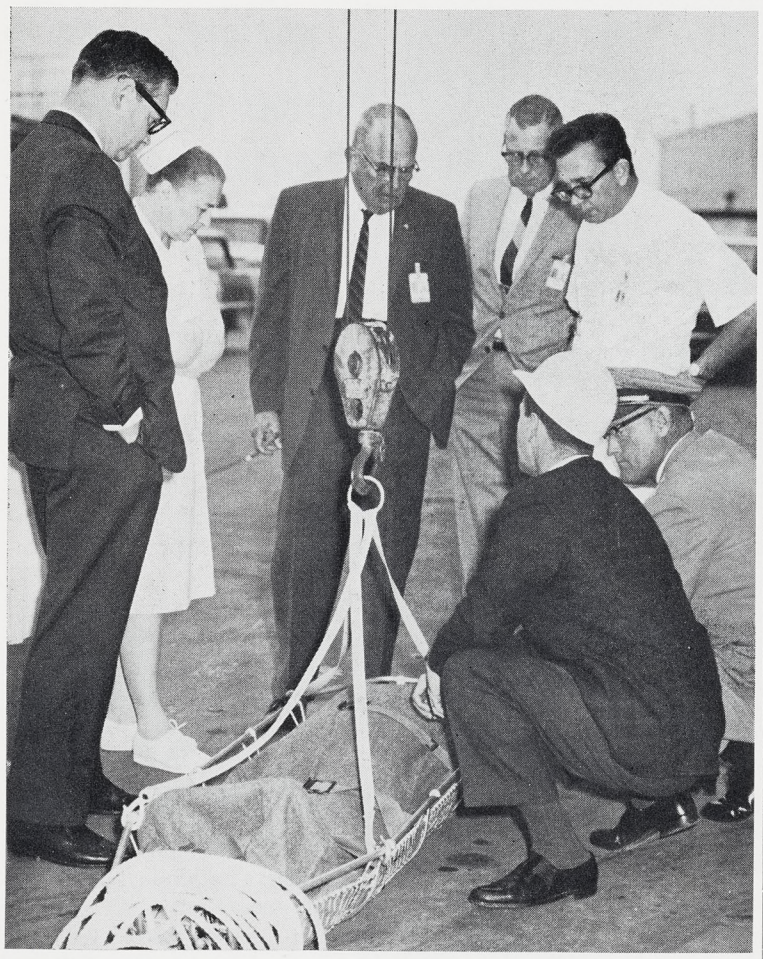
This first issue of the new Northrop News offers a fitting opportunity to tell the story of Northrop as it exists today as one integral corporation.

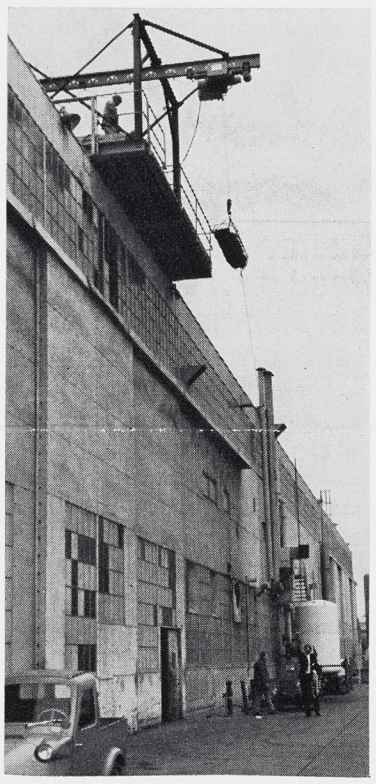
The accompanying story describes the over-all operation of Northrop in its many divisions, departments and facilities in the United States and overseas. Further stories will appear in the Northrop News from time to time to tell in more detail the work of individual Company organizations.





OLD WORLD AND NEW WORLDS—Age is evident in sun-baked buildings at Humosa, Spain, (left) that form backdrop for modern troposcatter antennas designed and built by Page Communications. At Northrop Space Laboratories (right), studies are being made that will enable man to explore new worlds. Chamber simulates space flight and has man-rating provisions.





MOCK RESCUE

Operations demonstrating proper procedures for removing "patients" from inaccessible areas via mobile boom crane were conducted February 10 at Norair Division. Participating were members of the Safety and Fire Prevention branch, Plant Protection branch and the Medical group. Secured in a wire basket stretcher with self-adjusting straps, the "patient" was lowered (right) from the Plant 1 roof while a nylon tag line (above) at the foot prevented basket sway and twist during the descent.

DATA DELUGE PLAGUES MANAGERS, CLUB IS TOLD

The greatest problem faced by management today is the digestion of data, a UCLA professor told the Ventura Division Management Club last month.

Dr. Harold Koontz, professor of management at the UCLA Graduate School of Business Administration, spoke at the Club's dinner meeting January 27 at the Los Robles Country Club, Thousand Oaks.

"We are living in the midst of a deluge of data," Dr. Koontz said, "but we have a dearth of information—that is, information translated and condensed so that a manager can use it."

The UCLA professor is a management consultant, has authored several books on the subject, and has been with the University for 12 years following 10 years of practice in the business world.

"The task of a manager," Dr. Koontz said, "is essentially that of establishing an environment which will make the most effective use of the individual people in a group. Management is not a manipulative thing. As an engineer designs black boxes, the manager must design environment—and keep designing it because the environment changes every day."

The UCLA professor pointed out that whereas there is a high level of research and development in the technical and scientific fields "we need a great increase in R&D relating to management techniques."

Ventura Club Gives $2000 to Colleges

Northrop Ventura's Management Club last month contributed $1000 each to Ventura College (Ventura) and Valley College (Van Nuys), it was announced by M-C President W. F. Green.

The money is to be used at the discretion of the schools to assist deserving students.

The gifts were in addition to two scholarships awarded annually to graduating high school seniors who are children of Ventura Division employees.

Many 'Made By Northrop' Items Aboard Latest Ranger Vehicle

When the Ranger 8 lunar probe was launched successfully February 17, a number of Northrop employees looked moonward with a personal interest.

The picture taking mission was started on its four-day journey on the first day of a week-long "launch-window," during which the vehicle had to be fired in order to intercept the moon.

Nortronics Division and Northrop Space Laboratories personnel provide industrial support to Jet Propulsion Laboratory on the Ranger program.

From launch vehicle separation until lunar impact, equipment manufactured, tested or integrated by Northrop Nortronics is responsible for keeping the spacecraft on a collision course with the moon. The Division's role in the Ranger program has increased in scope from development and manufacture of a few subassemblies to fabrication, test and integration of complete attitude control systems as well as the central computer and sequencer.

Specific hardware currently manufactured for Ranger vehicles by Northrop Nortronics at Palos Verdes Peninsula includes:

Sun sensors, which provide signals for spacecraft attitude control from initial sun acquisition until the mid-course correction maneuver, when inertial sensors take over, following which they again lock the spacecraft on the sun and earth.

Short range earth sensor, activated following sun acquisition to control roll by locking the directional antenna on earth.

Central Computer and Sequencer (CC&S), which provides computation and sequencing for critical events such as the mid-course maneuver and terminal maneuver.

Squib Firing Assembly, which triggers the opening of the solar panels and acts as the ignition switch to start and stop the mid-course correction motor.

Various control electronic devices, such as the autopilot and sensor switching amplifier, are also manufactured by Nortronics.

Other systems responsibility includes, inertial sensors (gyro and accelerometer modules)—attitude control and mid-course correction velocity information; actuators (directional antenna and jet vane)—earth acquisition and mid-course thrust control; and gas system (regulators, valves, nozzles, etc.)—gas jet "thrust" system.

The Division provides similar systems support and hardware for the Mariner fly-by missions.

Page Communications Busy In Asia, Europe, Bahamas

Page Communications Engineers, Inc. recently completed a radio network in Viet Nam, reached an historic milestone in the Bahamas, and launched a new project in Europe.

The Northrop subsidiary worked seven days a week at times to meet the U.S. Army schedule in South Viet Nam for a special purpose, 50,000 watt system, according to Joe Forno, project manager.

The station was on the air 56 days after a rice paddy site was selected, two full days ahead of schedule.

Another major step in bringing the Out Islands into direct communications with Nassau and the U.S. was completed with a phone call from The Hon. Donald d'Albenas, minister for Out Island Affairs in Abaco to Bahamas' Governor Sir Ralph Grey in Nassau.

Page President Joseph A. Waldschmitt attended the ceremony at Marsh Island, Abaco, and presented a commemorative plaque to Mr. d'Albenas.

When completed next spring, the system will link major islands in the Bahamas chain and allow visitors to the famed resorts to keep in telephone contact with the U.S.

The final link will connect Nassau with Exuma Island. It will be the longest of five direct lines in the system, which was begun by Page in early 1964.

In the latest project to get underway, Page's Rome affiliate, Edison-Page, has begun work on a radio network for the U.S. Army in Europe (USAREUR).

The 650-mile link will improve communications for the Army Procurement Center in Germany.

MARCH DATES SET FOR MERIT TESTS

National Merit Scholarship tests for 1966 Northrop awards will be given March 9 and 13.

Children of Northrop employees should make appointments for testing with their high school, according to the University Relations Advisory board.

To qualify for Northrop scholarships, a student must be a U.S. citizen (or in the process of becoming one) and must plan to attend a regionally accredited college in the U.S. and to obtain one of the usual baccalaureate degrees.

Northrop scholars will be selected by the National Merit Scholarship Corporation on the basis of test performance.

Norair Secretaries Attend NSA Dinner

The National Secretaries Association's Airborne Chapter held its 12 annual executive night dinner February 11 at the Sheraton-Marina Hotel, Playa del Rey.

Theme of the banquet was "Around the World Secretaries Wanted," according to Norair Association board members Marianne Weltman, Mayme Colombo, and Marge Stevens.

Miss Weltman is secretary to C. R. "Bob" Gates, manager, Marketing. Mrs. Colombo is secretary to Jack Mannion, manager, Manufacturing / Materiel, and Mrs. Stevens is secretary to Dick Beck, director, Manufacturing Engineering.

Northrop Ventura Hosts Navy CPOs

A group of chief petty officers from North Island Naval Air Station, San Diego, were recent visitors at the laboratories and manufacturing facilities of Ventura Division.

Assigned to Utility Squadron 3, the chiefs are responsible for the largest Navy target drone facility in the world. Many of the drone aircraft used by Squadron 3 are manufactured by Ventura Division.

The chiefs were in Ventura as luncheon guests of the Navy League of Ventura County.

OFFICIALLY IN BUSINESS NOW—Nortronics-sponsored Junior Achievement Company was recently presented Charter of Operation at special affair attended by Nortronics executives. At left is Jim Ricketts, director of Manufacturing, with Fred Engbarth, Jeanne Ryker, Jeanne Nault and Paul Gallegos, all leaders in firm called "DESCAL." Youngsters produce and market twin-pen desk sets.

NSL Slates Initial Mock Lunar "Walk"

The first trial "walk" on Northrop Space Laboratories' new five-story high lunar gravity simulator was scheduled to be made today, according to Dr. Walter Kuehnegger, principal investigator on a research program to study man's physical capabilities on the moon.

Suspended at the end of 63-foot cables, human subjects will "stand" perpendicular to a walkway tilted nine and one-half degrees from the vertical. The cables are connected to a dolly and rail arrangement installed at the top of the five-story NSL research building at Hawthorne.

The result simulates the effects of a man moving about on a surface where the pull of gravity is only one-sixth that of earth. Aiding in the simulation is an inclined treadmill hailed by Dr. Kuehnegger as the world's first.

The 12-month contract was awarded by NASA's Langley Research Center, Hampton, Virginia. Most of the work will be done by the Life Sciences section of NSL's Research department at Hawthorne.

Case Institute of Technology at Cleveland, Ohio, is associated with the project as a subcontractor.

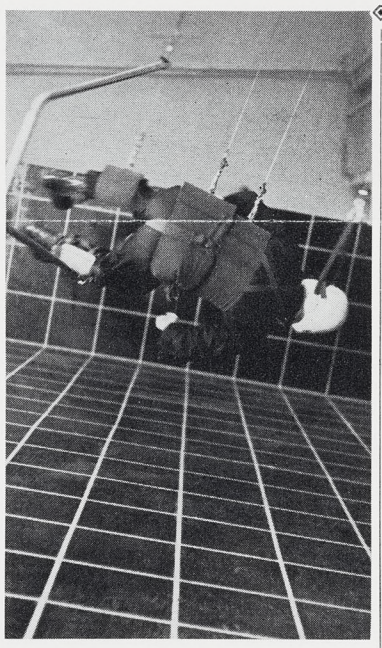
"One of the most important determinations in the program will be how long a man can remain on particular missions on the moon with the life support equipment he can carry with him," Dr. Kuehnegger said. "This information will be obtained by investigating the energy requirements of man while performing given activities in a pressure suit under various pressure levels at one-sixth gravity.

"Conclusions may then be drawn as to the over-all amount of oxygen, the amount of carbon dioxide-absorbing chemicals, and the cooling provisions that must be supplied in his back pack for the man to complete given work assignments," he said.

Experiments will be performed by subjects both in and out of the pressurized suits that man must wear on the moon. Unsuited performance will provide base line data from which to measure further results.

A smaller lunar gravitational simulator has been in use for familiarization by NSL scientists for some time.

MOON WALKER—Dr. Walter Kuehnegger of NSL's Life Sciences section, above, dons lunar gravity simulator harness with aid of Engineer Frank Rizzo. Below he is shown in middle of a somersault begun from a "standing" position against nearly vertical board at far right. Device, an experimental test model inside NSL high bay area, simulates lunar gravity, one-sixth that of earth. Dr. Kuehnegger will head work under NASA contract to study man's physical capabilities on moon, for which new simulator has been built alongside five-story research building.



VENTURA ASTIR AS PECK FILMS SCENE AT PLANT

When Gregory Peck appeared under the olive tree in front of the Ventura Division plant, a number of secretaries had to stifle the urge to abandon their desks for a closer look.

Universal Pictures was granted permission by Corporate Vice-president and Division General Manager George Douglas to use Northrop's Conejo Valley plant as a backdrop for scenes in the forthcoming movie, "Mirage."

Actor Peck, with full entourage of Hollywood equipment, completed the scenes in two hours.

In return for the Northrop courtesy, Universal donated $200 to the Ventura School for Girls at Camarillo in the name of Ventura Division employees.

Grogan Transfers To Marketing

George C. Grogan, former project director of the Supersonic Transport Advanced program, is now assistant manager, Marketing, at Northrop Norair, reporting to Marketing Manager C. R. "Bob" Gates.

Mr. Grogan joined Norair in 1959. He was chief, Aero and Propulsion Sciences, and was project director on the Northrop/Hawker Siddeley P.1127 before his most recent assignment. He holds degrees from the University of Oklahoma and Massachusetts Institute of Technology.

EEK! A SPACE MOUSE—Venice High School science teacher, Mrs. Joy Lauffenburger, reverses usual feminine reaction and shows no fear of "huge" mouse used in space research by NSL radiation biologist Dr. Jerome Gamino. Magnified in laboratory viewing lens, creature is Perognathus longimembris who looms large among mammals when measured in terms of tolerance to radiation.

NORTRONICS MAN BELONGS TO TWO SCHOOL BOARDS

Don Weaver, Precision Manufacturing general foreman, at Nortronics Special Projects section may be one of the first men to serve on two school boards at the same time.

Mr. Weaver missed most of the Lawndale Elementary School District board meeting February 9 because he was being sworn in as a trustee of the Centinela Valley Union High School District.

Elected to the Lawndale board, he was appointed to the other following the resignation of another trustee.

Mr. Weaver said he would remain a trustee of the elementary district board until a smooth transition could be worked out with other board members.

He said he would run for election to a full term on the Centinela District board. Elections for both boards will be April 20.

Mr. Weaver has been with Northrop since 1951.

Gustavson Named Head of Program Development

Danish - born John Gustavson has been appointed director of Program Development at Northrop Space Laboratories, it was announced this month by Roy Jackson, vice-president and assistant general manager.

Mr. Gustavson brings to Northrop an established reputation in aeronautical engineering and rocket propellants.

His principal duties at the Hawthorne facility are evaluation and implementation of efforts required to improve NSL skill and technology.

An associate fellow in the American Institute of Aeronautics and Astronautics (AIAA), Mr. Gustavson was founding president of the Arrowhead Section and is currently vice-chairman of the Los Angeles Section.

Las Vegas Outing Set for Travelers

Final call for all fans of legalized gambling and fabulous shows (a la Las Vegas) was sounded this week by the Northrop Interdivisional Travel Club.

Dates for the group excursion are March 19 - 21. However, a $15 deposit (total price, $34.65) must be made at Personnel Activities offices throughout Northrop organizations no later than Friday, February 26.

Club Elects Officers

The Antelope Valley Northrop Recreation Club Palmdale - Edwards has elected new officers for the coming year, it has been announced.

The officers are: Chuck Smith, recreation chairman, Palmdale; Fred Burns, vice-chairman, Palmdale; Daphine Abrams, secretary, Edwards; and Claude Gorham, social events chairman, Edwards.

Wierk Named Head of Data Processing

Paul Wierk, formerly director of Technical Administration at Northrop Norair, has been appointed corporate director of Management Information.

In his new assignment, Mr. Wierk will report to Richard R. Nolan, vice president-Manufacturing and Administration, and will be responsible for all machine data processing and computing services within the company.

Mr. Wierk joined Northrop in 1953. He will be located in the company headquarters in Beverly Hills. He replaces Milton Stone, who has resigned.

Oliver Discusses Product Licensing

Finding new products and generating new business through product licensing was described February 4 for the Strategic Industries Association of Los Angeles by Northrop's John E. Oliver.

In addition to being Corporate administrator, Product Licensing, for Northrop, Mr. Oliver is chairman of the Licensing committee of the Los Angeles Chamber of Commerce.

Quality Conference Hears E. C. Bennett

Norair's E. C. Bennett, chief of Quality Control Engineering, last month addressed the 8th annual Cal-Poly Conference of the San Bernardino Section of the American Society for Quality Control (ASQC).

Mr. Bennett was one of 25 quality experts representing industry and government agencies. He is a founding member and Fellow of the ASQC.

R. S. Catlin, manager of Norair Quality Control, was a session chairman at the conference.

Going my way?

Going My Way forms, 59-228, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Torrance Blvd. & Hickory, Torrance. Lela Love, ext. 2133, 1834, 329-3513. 2

164th St. & Inglewood Ave., Redondo Beach. Harriet Chaney, ext. 2170, 2133, FR 2-6082. 2

7:30 a.m. — 4:15 p.m.

Sepulveda Blvd. & 237th Pl., Torrance. Maxine Farberg, ext. 1458, 674-3359. 3

Century & Felton, Inglewood. L. G. Burgess, ext. 1204, 672-0203. 3

8 a.m. — 4:45 p.m.

Olympic & Santa Monica Blvd., Los Angeles. Kay Johnson, ext. 2611, 474-9633. 5

Lemoli & Compton Blvd., Gardena. Margo Campbell, ext. 1481, 676-5505. 5

Beverly Glen Blvd. & Santa Monica Blvd., Los Angeles. J. W. Murphy, GR 4-3433. 5

Crenshaw & 116th, Inglewood. John W. O'Hara, ext. 1771, PL 5-6061. 5

Classified

To place an ad in the Northrop News, obtain classified ad form 59-308 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Violin, full size, $250. P.V. Estates, 378-7778.

Dodge carryall, ¾-ton 4 x 4 military, many new parts & extras, $950. Redondo Bch., FR 5-4910. A

Bar, 8′, mahogany, 4 stools, $60. Gardena, 320-5014. A

Ford, 1954 conv., 292 cu. in. eng., floor shift, $275. L.A. 44, 755-7093. A

Bicycle, boy's 26″ lightweight, coaster brake, $15. Inglewood, FA 8-3306. A

Shotgun, Winchester, 16 ga., full choke, repeater pump, $45. Inglewood, 755-8104. A

Nova II special sport cpe., 1963, auto. trans., $1700. Hermosa Bch., FR 4-5217. A

Bicycle, girl's 16″ w/training wheels, $10. Inglewood, PL 5-4497. A

Sofa, custom-made, green & gold, contemporary, $75. Inglewood, 751-0509. A

Stereo Hi-Fi components, AM/FM tuner, stereo turntable, dual amplifiers, dual preamps, & cross-overs, 4 speakers, $66. Hawthorne, 676-0418. A

Pups, boxer, pedigree, females, $30-$50, males, $60-$70. Hawthorne, OS 6-9968. A

Stove, custom-made, $10. Gardena, 329-9484. A

Tricycle, $4. P.V. Estates, FR 5-5097. A

Chevrolet, 1956 sedan, Hydromatic, $400. Long Beach, GA 3-1363. A

Lawn Edger-trimmer, electric, $10. P.V. Pen., 377-5319. A

Stove, O'Keefe & Merritt, 4-burner, grill, $30. L.A. 44, PL 7-4305. A

Shotgun, Remington auto., model 11, 2 chokes, recoil pad, leather case, 12 ga., $100. Pac. Palisades, 454-2057. A

Range, apartment-size, gas, $25. Hawthorne, 675-1031. A

TV, Packard-Bell early American, 21″, $25. Inglewood, EX 8-8805. A

Refrigerator, 7.3 cu. ft. Coldspot, $50. Torrance, DA 5-3724. A

Bar Stools, 2, $10. Hawthorne, OS 5-3423. A

Camera, Minolta SR-1 & case, $110. Inglewood, 671-9269. A

Rifle, Marlin auto., 22 cal. w/scope & case, $40. Redondo Bch., 371-8907. A

Bicycle, girl's 24″, Schwinn Hollywood, $20. Redondo Bch., FR 2-3827. A

Pickup, 1964 Chev. ½-ton, low milage, custom cab, all extras, $1875. Hawthorne, OR 5-4905. A

Rambler, 1957 4-dr., sedan, r/h, w/w, $400. Gardena, 323-6074. A

Golf Clubs & bag, women's, $65. Inglewood, 674-4192. A

Washer, Kenmore, $125. Hawthorne, OS 5-1057. A

VW Sedan, 1957, good tires, $300 dn., $31.65 mo., $799. Torrance, DA 3-4257. A

House, Rolling Hills, 3-bdrm., 2-bath, GE kitchen, patio, fireplace, landscaped, fruit trees, near schools, newly dec., 1600 sq. ft., $42,750. Rolling Hills, 833-9747. A

Range, elec., Frigidaire, compl. w/deep well cooker, $30. Downey, 923-9957. A

Outboard motor, 15-hp, Evinrude, operated 2 seasons, $85. San Pedro, TE 1-9545. A

Cabin Cruiser, Catamaran, 20′, 8′ beam, self-bailing transom, 2 50-hp Evinrude motors w/generator, 2 40-gal. built-in tanks; 2 6-gal. portable tanks, many extras, $2400. Torrance, DA 4-0341. A

Desk & chair, child's, maple, $15. LA., PL 7-4705. A

Washer-dryer comb., Kenmore, $100. El Segundo, EA 2-0678. A

Chrysler, 1951, 3-spd. factory stick, traction masters, $1400. L.A. 44, PL 7-5455. A

Buick Special, 1954, 4-dr. sedan, stick shift, 49,800 miles, r/h, new w/w tires, battery, clutch, $175. P.V. Pen., FR 7-7489. A

Buick Special, 1955, good tires & engine, $200. Box 101. A

Mercury, station wagon, 1948, woodie, 2 mag rims, $250. Box 102. A

Cadillac coupe de ville, 1964, full power, 9000 miles, $4700. Manhattan Bch., FR 6-9173. A

Sunbeam, 1962, low mileage, $1350. Beverly Hills, CR 6-4879. A

Range, Kenmore elec., pushbutton, rotisserie, other extras, $165. Gardena, OS 6-7316. A

Thunderbird, 1958, $895. Redondo Bch., 376-8545. A

Stove, gas, white, Magic Chef, $40. Inglewood, PL 8-5039. A

Impala, 1961, 2-dr., W-3 eng., factory air cond., all extras, $1450. Northridge, 345-9962. A

For Sale

Range, O'Keefe & Merritt, narrow width, $50. Gardena, 327-2279. A

Revolver, 22, Hy Hunter Frontier 6-shooter model, $50. Malibu, 479-3183. A

Acreage, in San Diego County, 1-9 acres, reasonable terms, $2000-$4000 an acre. Hawthorne, 676-5253. A

Ford 500 Fairlane, 1961, 4-dr., p/s, auto. trans., $1050. Hawthorne, 679-1992, EX 6-5797. A

Sofa, matching chair set, custom-made Provincial, dk. brown, used 1-yr., $240. Redondo Bch., 371-3294. A

Plymouth, 1957, 4-dr., sedan, $200. Gardena, DA 4-3542. A

Triumph, Tiger Cub, 1964, scrambler 200 cc, $600. Gardena, 329-9353. A

Bedroom Set, 3-pc., modern, blond, $100. Inglewood, 672-0295. A

Skis, 6′9″ Fischer Pioneer w/Eckel safety bindings, $30. P.V. Estates, FR 5-0867. A

Home, 3-bdrm. w/family room, 2 baths, existing G.I. loan, pay $110 P & I w/$6000 dn. or 90% conventional loan, $29,500. Torrance, FR 1-2526. A

Home, 3-bdrm., Hawthorne, corner lot, lge. backyard, $19,500. Hawthorne, OS 9-3008. A

Camera, 8mm movie, mag. load, Dejur Fadematic, turret model, 13mm f:1.9 & 36mm f:2.8, GE exposure meter & type A filter, $50. Box 103. A

House trailer, 1958 Lakewood 15′, spare tire & wheel, jacks, 1965 lic., $650. Lakewood, KE 5-8063. A

House, 3-bdrm., family room, 1½-bath, covered patio, dble. detached gar., large lot, 2½ mi. to Northrop, call for appt., $23,750. Gardena, DA 3-6884. A

Accordion, 120-bass, w/case, $10. Venice, EX 1-2040. A

Buick, Roadmaster, 1957, $295. L.A., 756-0068. A

Student desk, 18″ x 36″, 4-drwrs., $10. Rolling Hills, FR 5-8778. A

Bicycle, Sting Ray, front-hand brake, $30. P.V. Pen., FR 8-2810. A

Outboard, 12, 7½-5-hp comb., 6-gal. tank & cart, $125. Inglewood, 671-8368. A

Ford Galaxie 500 club coupe, 1959, r/h, w/w, auto. trans., $700. Los Alamitos, 430-4407. A

Table w/4 padded chairs, Virtue Bros., extra leaf, cherry wood, $40. Inglewood, 671-4986. A

Austin Healey Sprite MK II, 1962, $995. Hermosa Bch., 379-7567. A

Alfa Romeo Spyder, 1962, 28,000 orig. miles, r/h, seat belts, spare tire, tools & handbook, $1300. Lynwood, 635-3784. A

Chevrolet, 1957 4-dr. V-8, auto. trans., p/b, $595. Hawthorne, 676-6786. A

Talking Mina bird, w/2 cages, $50. Inglewood, OR 1-1660. A

Silver Dollars, uncirculated, in plastic tubes, $26 roll. Box 104. A

Home, 3-bdrm., Culver City schools, many features, $26,950. L.A., UP 1-0999, EX 1-4106. A

Morris Minor, 1959, rebuilt eng., $300. Lawndale, 675-4992. A

Pups, Pom., AKC reg., champ background, 1 male, 1 female, $85. Hawthorne, 676-9670. A

Honda 50, C100, $150. L.A., 645-7635. A

Corvair Monza 900, 1961, new valves, shocks, brakes & paint, $1100. Gardena, 323-3424. A

Pontiac, 1957, take over $28 mo. pymts., $418 bal. Box 105. A

Coffee & tea service, 5-pc. silver, in orig. crate, $175. Inglewood, OS 6-1475. A

Washer, wringer type, Easy, $15. Hollydale, ME 3-2395. A

Plymouth Fury, 1960 4-dr., 1 owner, $650. Garden Grove, (714) 892-7440. A

Winch, 12-volt boat-trailer, $60. Torrance, 371-9921. A

Cocktail Dress, size 12, full length, empire-style, marlin blue crepe, $25. Gardena, DA 3-3245. A

House, 3-bdrm., 1-1/3 bath, landscaped, 20x40 pool, view of San Pedro Harbor, ½ acre, $41,500. San Pedro, TE 3-9455. A

Ford, 1961 conv., r/h, new top & tires, $975. Lomita, NE 1-9573. A

Plymouth Belvedere, 1964 2-dr. h/top, 426 S eng., 4-spd. trans., r/h, $2500. Lomita, DA 6-6214. A

Ford, 1957 station wagon, Country sedan, 9-pass., r/h, w/w, auto. trans., $325. L.A. 47, PL 6-0015. A

Motorcycle, 1964 Triumph Bonneville, $925. Manhattan Bch., 372-4951. A

Pontiac, 1958 2-dr., big eng., stick shift, chrome wheels, $700. Redondo Bch., FR 6-7269. A

Tire & wheel, 5.30/4.50-12 for Fiat, $10. Hawthorne, OS 5-2081. A

Dog, Chihuahua, fawn & white, 1-yr.-old, female, reg., $50. Redondo Bch., FR 8-1658. A

Yamaha, 1964 250-ydi, 900 mi., $550. Hawthorne, 676-1471. A

TV, 16″ RCA, cabinet, $14.95. Torrance, 835-1031. A

Range, gas, O'Keefe & Merritt, $40. L.A. 8, AX 5-5813. A

Volkswagen, 1964 sedan, 12,000 mi., $1695. Inglewood, PL 6-7337. A

Airplane, home-built, partially completed, 2-place Doodle-Bug, drawings, Lycoming 0-290-G eng., other misc. parts, $300. Redondo Bch., FR 4-2915.

Breakfront, lge., mahogany, $150. Hawthorne, 676-0787. A

For Sale

Volkswagen, 1960, r/h, 1965 license, $995. Torrance, FA 8-7644. A

Buick, 1958 Super Riviera, full power, $425. Pasadena, 796-4473. A

Ford, Starliner, 1960, 2-dr. h/top, p/s, r/h, $50 & take over pymts., $650 bal. Gardena, 679-3927. A

Range, Kenmore, gas, $25. Hawthorne, OS 5-1860. A

Volkswagen, 1960 sed., radio, $875. Inglewood, 675-3563. A

Corvair, 1962 4-dr. sed., r/h, low mileage, $795. Rolling Hills, FR 5-7564. A

Home, 3-bdrm. & family room, 2-bath, fireplace, 1550 sq. ft., West Canoga Park, $24,500. Los Alamitos, 430-7721. A

Roto-Tiller, 4-hp, $95. Torrance, FR 1-2948. A

Stereo Phono, Decca portable, $35. L.A. 25, 478-5732. A

Television, 21″ Capehart w/maple cabinet, $20. Manhattan Bch., FR 4-0021, FR 9-6451. A

Go-Kart, mag. front wheels, chain drive Power Product eng., $80. Inglewood, PL 6-7681. A

Range, Philco, elec., $65. Gardena, GA 2-7988. A

Sectional, 4-pc. hand quilted, foam cushions, wing back Early American, $450. Pacoima, 882-0761. A

Camper, 1961 turnpike 8′ cab over, $800. Inglewood, 632-9377. A

Corvair, 1961 700 deluxe, 4-dr., auto trans., r/h, $750. Miraleste, TE 1-4586. A

Cadillac cpe., 1960 full pwr., orig. owner, $1850. P.V. Estates, 378-8953. A

Chevrolet, 1962, Biscayne, r/h, 4-dr., stick, $1150. Huntington Beach, (714) 962-3834. A

Chevrolet, 1956 2-dr., rev. chromes, $395. Hawthorne, 676-6324. A

Pups, German shepherd, 8-wks.-old, $5. Fullerton, 529-4788. A

Dot Scrambler, 1964, $575. Manhattan Bch., FR 4-3365. A

Barber Set, Sears Roebuck Craftsman, used 3 times, $7. Hawthorne, OS 5-7088. A

Rambler American 330, 1964, 4-dr., auto., r/h, $350 plus $66 mo. for 21 mos., approx. $1700 bal. Hawthorne, 679-0556. A

Lumber Rack, w/rigging levers for ¾-ton truck, $70. San Pedro, 370-2023. A

Pontiac Catalina Vista, 1959, 4-dr. h/top, r/h, auto. trans., $750. Bellflower, 867-5892. A

Bed, ¾ rollaway type, w/mattress, $30. Hawthorne, OS 6-8789. A

Wanted to Buy

Power mower, reasonable price. Torrance, 371-3471. B

Light Camper for 8′ Chevrolet Fleetside. Downey, TO 7-0593. B

Surfboard, boy's, for age 14, reasonable price. Inglewood, 371-9730. B

Travel Trailer, 21′-23′, s/c, late model w/twin beds. Inglewood, OR 1-2058. B

Baby Furniture, good condition. S. Monica, EX 3-5421. B

Lamp, Calif. Dri-Aire. Torrance, FR 2-7270. B

For Trade

Bedroom Set, matched, for den furniture. Hawthorne, OS 9-6982. C

Reducing Couch, Stauffer, trade for refrig. w/crosstop freezer. Manhattan Bch., FR 2-4980. C

Rentals Offered

Apt, 1-2 bdrms., furn. or unfurn., sound proof, carports, lease opt., close to fwys., pool, $125 & up. N. Hollywood, 762-4310. E

Apt, 2-3 bdrm., near Northrop, 1½-baths, carport, patio, children OK, s/p walls, $120 & $145. Los Alamitos, 679-7551. E

House, 3-bdrm., fenced yard, 5 miles to Northrop, $135 mo. Redondo Bch., FR 9-9786. E

Apt, 2-bdrm., unfurn., garage, $87.50. Box 106. E

Apt, bachelor, furn., $55 mo. Inglewood, OS 6-2162. E

House, 2-bdrm., fenced yard, $90 mo. Lawndale, OS 5-9695. E

Apt, for lease, Palms area, 1-2 bdrm., patios, near schools, $105-$150. Beverly Hills, CR 1-9818. E

Mountain Cabin, Green Valley Lake, weekend, $35;week, $65. Gardena, 324-5961. E

Apt, 2-bdrm., furn., carport, lge. closets, close to Northrop, util. pd., $125. San Pedro, TE 3-2512. E

Apt, 1-bdrm. & den, unfurn., 2 miles from Northrop, $95. Inglewood, OR 2-0304. E

Apt, 3-bdrm., furn. or unfurn., pvt. gar. avail., $130-$115 mo. Eastview, 422-4022. E

Studio Apt, 2-bdrm., 1½ bath, 1 block to Northrop, $130. mo. Hawthorne, 676-6134. E

Apt, 2-bdrm., 2-bath, gar., Redondo, $130 mo. on yr. lease. Redondo Bch., FR 2-0448. E

Apt, 2-bdrm., unfurn., fireplace, 2 baths, laundry facil., ½ mile to Norair, $140 mo. Hawthorne, 679-1358. E

House, 2-bdrm., unfurn., no children, no pets, walking distance to Norair, $100 mo. Box 107. E

Rooms, elec. heat, laundry facil., $12.50-$15 wk. Lawndale, 371-6775. E

TAC GENERAL FLIES F-5B—Maj. Gen. John C. Meyer, commander of the Tactical Air Command's 12th Air Force, enters front cockpit of an F-5B preparatory to his familiarization flight at James Connally AFB, Tex. Northrop Norair Pilot Bill Morse is at right.

CAPABILITIES: Spanning The Aerospace Spectrum

(Continued from Page 2)

radio-controlled target, surveillance, and logistics drone aircraft.

Northrop Ventura has become a leader in the design and production of advanced landing systems for the recovery of America's astronauts and space vehicles from orbital and lunar flight. The division supplied the parachute recovery system for all Project Mercury spacecraft and is doing the same on Project Gemini.

Current operational drones include the rocket-powered supersonic RP-76 and its Navy counterpart, the RP-78; the OQ-19 (Navy KD2R-5) propeller-driven target, and the MQM-75A.

Another facility, Aero Instruments of North Hollywood, California, designs and markets various special meters, switches, and electro-mechanical devices.

The company's activities in space technology are advanced by Northrop Space Laboratories, located primarily at Hawthorne, California. NSL concentrates on the design, development, and manufacture of space vehicles and systems, and research in life and physical sciences. A facility in Huntsville, Alabama supplies direct engineering support to NASA's Marshall Space Flight Center.

Man's survivability in space is the ultimate objective of NSL experiments in Life Sciences and Physical Sciences. This work involves many scientific areas, including biology, biodynamics, behavioral sciences, nuclear energy and radiation, plasma physics, chemistry, and geology.

From its headquarters in Beverly Hills, Northrop International —the company's global representative — manages Northrop's overseas marketing interests.

Also active on a world-wide scale is the wholly-owned Northrop subsidiary, Page Communications Engineers, Inc. Although its headquarters are in Washington, D.C., Northrop Page performs design, construction, operation, and maintenance of advanced communications systems and installations that leap across national boundaries and oceans all over the globe.

The subsidiary recently completed the first nationwide military communications network in South Vietnam, and a voice and teletype system for the U. S. Strategic Air Command between England, Spain, and Morocco.

In another area of global communications, Northrop shares ownership of the United States Underseas Cable Corporation of New York City.

The company specializes in the manufacture of underseas cables and equipment; cable laying, and surveying.

Working entirely in the commercial or nonmilitary field are the important wholly-owned subsidiaries, Northrop Architectural Systems and Pacific Curtainwall, Inc., with headquarters in Los Angeles. These organizations combine to offer a systems approach to architectural development, providing architect, contractor, and client with a wide choice of known quality products in architectural aluminum and other metals.

Rentals Offered

Apt, 1-bdrm., service porch, gar., patio, Hawthorne Blvd. & El Segundo area, $90 mo. Manhattan Bch., FR 6-2122. E

Apt., 1-bdrm., lge. closets, tile bath, $95 mo. Redondo Bch., 376-2117. E

Rentals Wanted

Apt, 1-bdrm., unfurn., w/stove & refrig., near Northrop or El Camino Col., no children, would lease, $75 mo. approx. Hawthorne, OS 9-3978.

Lost

Textbook, Pestel, Regelungstechnik German, lost & found, Norair, ext. 1972. P.V. Estates, 378-5344. J

Personals

USS Lexington CV-2 Minuteman's Club will hold its 11th annual reunion June 24-27 in Long Beach. Crew members 1927 through 8 May 1942, attached to air squadron or served aboard in any capacity are invited. Hawthorne, OS 5-0563. L

Your kind expression of sympathy is gratefully acknowledged & deeply appreciated. **Frank Perugini & Family.** L

For Sale or Trade

Bicycle, boy's 26″, 3-spd., light weight, Royce Union, $15 or trade for 8mm movie projector. Canoga Pk., 348-3100. M

Chevrolet, ¾-ton, 1963, many extras, sleeper camper, $1900 or trade my equity for older car or truck. Box 108. M

FLANNIGAN NAMED VENTURA MANAGER OF MARKETING

Appointment of Thomas E. Flannigan as manager-Planning and Marketing of the Ventura Division has been announced by George F. Douglas, Ventura Division vice-president and general manager. Joining Northrop in 1953, Mr. Flannigan moved to Ventura Division in 1960 as marketing representative. He has been director of Customer Relations since 1962.

Flannigan

A native of Santa Monica and former Marine Corps officer, Mr. Flannigan attended both Santa Monica City College and Loyola University.

Mr. Flannigan succeeds D. W. Hamilton, recently named manager of Northrop's Western Regional office.

APOLLO

(Continued from Page 1)

the joint Air Force-Navy Parachute Facility.

The parachute landing system for Apollo is developed by Northrop Ventura Division under contract to North American Aviation's Space and Information Systems Division.

North American is principal spacecraft contractor to NASA's Manned Spacecraft Center.

The landing system consists of three 88-foot parachutes — two of which are sufficient for landing the five-ton spacecraft—and five smaller chutes.

Central to the entire system is an electrical sequence controller which automatically senses one of three different types of landing conditions and releases each parachute in the appropriate order.

Northrop Systems Land on Moon

Packed with numerous Northrop system, Ranger 8 landed on the moon February 20.

The rocket roared aloft from Cape Kennedy February 17. Its primary mission was to photograph the Sea of Tranquility, a site being considered for landing Apollo astronauts.

A more detailed story on Northrop's participation by Nortronics and NSL in the Ranger program appears on page three of this edition.

FIRST HAND INFORMATION—Northrop Ventura Plastic Shop personnel above had a special request—to see where inverted flight fuel tanks and some 97 plastic parts they make were assembled on T-38, F-5 and F-5B. Jack Lind of Ventura and John Williams of Norair made the arrangements for 25 Ventura employees.

Zero Defects, Satellite, Gravity Tests in News

A space satellite, an employee motivation program and a study of man's physical capabilities on the moon were among Northrop projects announced this month.

The satellite, designated OV2-1, was built by Northrop Space Laboratories in Hawthorne to ride aloft a Titan III vehicle.

As a bonus payload for a development launch, the satellite contains numerous sensing devices.

A new addition on top the NSL building is a lunar gravity simulator, designed to test the effects of a man moving on a surface with a gravity pull one-sixth that of the earth.

The contract was awarded by NASA's Langley Research Center at Hampton, Virginia. Most of the work will be performed by the Life Sciences section of NSL's Research department.

Nortronics Division's Precision Products Department (PPD) at Norwood, Massachusetts, has launched a zero defects quality control program which emphasizes prevention of mistakes rather than detection and cure.

Zero defects is intended to elevate and maintain over-all performance standards to reduce operating costs while insuring maximum success of military and aerospace missions.

GEMINI

(Continued from Page 1)

research and development phases of the program. In addition, the parachute system operated satisfactorily on January 19 when an unmanned Gemini spacecraft was launched from Cape Kennedy on a 2000-mile flight down the Atlantic Missile Range.

The landing system consists of an 8.3-foot drogue parachute, an 18-foot Ringsail pilot parachute, and the main 84-foot diameter Ringsail landing parachute. In operation, astronauts returning from orbit will deploy the drogue chute at about 50,000 feet altitude to stabilize the descending spacecraft. At 10,600 feet altitude the drogue extracts the pilot parachute and two and one half seconds later the main chute is deployed for final landing and ocean recovery.

Gun Club Slates Awards Dinner

The Golden Valley Gun Club has been selected as the site for the annual Northrop Ventura Rod and Gun Club's awards dinner, March 6.

Commissioner Dorothy Prychoda reports the winning gun team of the year will be feated as "guests" by the losing team.

Ventura Recreation Club Good Time Table

For enrollment or information on activities listed below, call or contact Recreation Club, Ventura, ext. 480.

ARCHERY, Dale Milligan
Meet 1st Sunday, 10 a.m., Balboa Park Recreation area, Encino. Beginners with or without equipment welcome to free instruction.

BOAT, Gus Johnson
Meet 1st Thursday, 7:30 p.m. DAV Hall, 6543 Corbin Ave., Reseda. March 4 meeting to plan Easter outing.

BOWLING, Zack Silvers
Teams compete in leagues on Tuesday and Thursday evenings at Conejo Bowl, and Friday evenings at West Valley Bowl. No formal meetings.

BRIDGE, Tammy Tracy
Weekly bridge games at lunch period in cafeteria.

CAMERA, Dan Cashier
Meet 1st Monday, 7:30 p.m., 18146 Sherman Way, Unit 7, Reseda.

GOLF, Ron Morin
Monthly tournaments on announced dates with meeting at time of tourney.

RIFLE & PISTOL, Joe Letteriello
Meet 4th Sunday, 7 a.m., Camp Pendleton Range. Compete in Valley league tourneys and fields top marksmen in state and regional matches.

ROCKHOUNDS, George Rigby
Meet 2nd Friday, 8 p.m., 18146 Sherman Way, Unit 7, Reseda, to plan field trips and to use Club lapidary.

ROD & GUN, Dorothy Prychoda
Meet 3rd Tuesday, 8 p.m., DAV Hall, 6543 Corbin Ave., Reseda. Fishing trip at Lake Casitas on March 20.

SPORTS CAR, T. F. Twitchell
Meet 1st Tuesday, 7:30 p.m., DAV Hall, to plan regular competitive events which occur on 3rd weekend of each month.

CORPORATE: Marketing, Planning Strengthened

(Continued from Page 1)

sponsibility of the division general managers for the marketing and planning operations under their command. However, the recent corporate actions will permit the preparation of a strengthened framework of over-all corporate planning and guidance leading to more effective deployment of total capabilities and a consequent improvement in new business success rate.

In the corporate Marketing organization under Mr. Lord, Frank S. Perego is director of Domestic Marketing Operations, and General Patrick W. Timberlake, corporate vice president-Northrop International, continues to direct the company's international marketing effort.

John Alison, corporate vice president - Customer Relations, continues to be responsible for customer relations wherever they exist. Dr. William C. Ellet is director of Market Research and Analysis.

Also reporting to Mr. Lord are S. W. Towle, Jr., corporate vice president-Eastern District Office; Daniel J. Harnett, director of Contracts and Pricing; and William H. Habblett, director of Special Events.

Increased emphasis has been placed on planning operations. Tactical planning—the search for and analysis of market opportunities — is being performed in Market Research and Analysis. Dr. Ellet and his staff will combine scientific knowledge with marketing know-how in searching out and evaluating market prospects for the entire company.

Their findings re-enforce the marketing work conducted within the divisions and provide leads for new business.

While emphasis on military and space requirements continue, all Northrop Marketing organizations are alert to the possibilities for new programs that can be expected to develop within the government's broadening approach to sociological and geo-political problems.

For instance, the company at present has proposed a promising new project for the Office of Economic Opportunity. This program would provide training in electronics techniques to hundreds of under-skilled persons.

Long Range Planning, in the past performed by Development Planning, has been redesignated Forward Planning. Under the leadership of Mr. Dennis, Forward Planning is focused on studies of long range technical, geo-political, and economic trends that may offer new opportunities for the company.

Forward Planning differs from Market Research and Analysis in that the latter is concerned with specific market opportunities already identifiable. Forward Planning will analyze the total environment in the United States and throughout the world in order to determine fundamental changes that are likely to occur and to identify new opportunities that may result.

Forward Planning will advise corporate and division management as to effects of long range trends on company decisions, particularly those involving the commitment of company resources.

Nortronics Wins $6 Million Pact For Gyroscopes

Contracts totaling more than $6 million for production of auxiliary gyroscopes used in the Minuteman-II inertial guidance system have been awarded to Nortronics Division by North American Aviation's Autonetics Division at Anaheim.

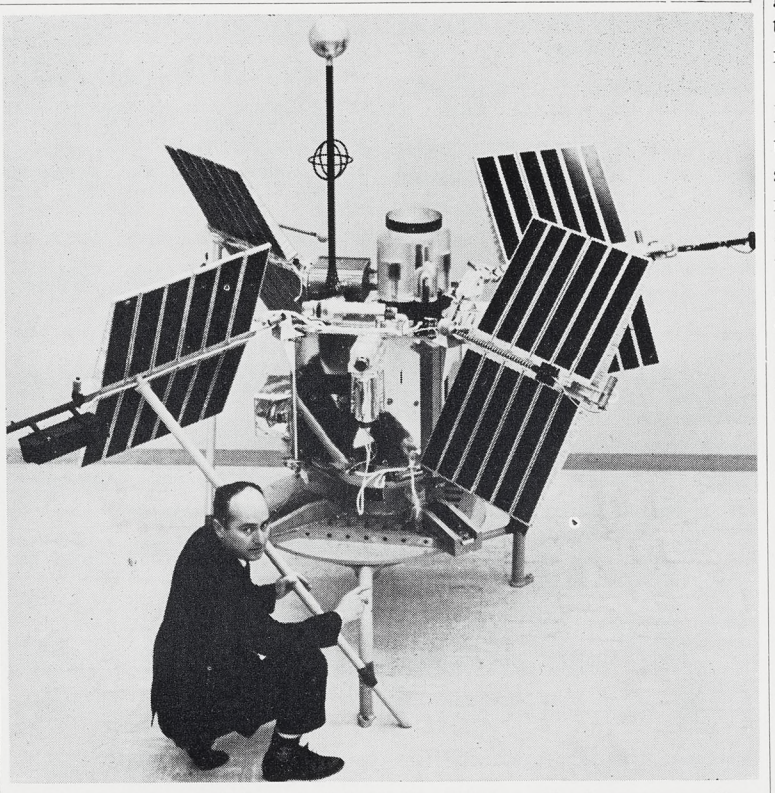
The single-axis, gas bearing gyro will be produced at Precision Products Department in Norwood, Massachusetts.

The auxiliary gyro was developed by PPD specifically for the Minuteman-II ICBM.

Rex Fairless Elected Conejo Chamber Prexy

Rex B. Fairless, Ventura Division director of Industrial Relations has been elected president of the Conejo Chamber of Commerce.

Director of Industrial Relations since 1962, Mr. Fairless has served as Northrop representative in the Chamber since the Division occupied its new plant early in 1963.



SPACE ENVIRONMENT SENSOR—William C. Armstrong, Program Manager of OV2-1 at NSL, kneels beside completed satellite. Built by Northrop Space Laboratories for U.S. Air Force Office of Aerospace Research, vehicle is to ride aloft Titan III-A as a bonus payload during a development launch.

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NORTHROP NEWS

NORTHROP VENTURA

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Cost-Saving Suggestions Rise 300%

Northrop Ventura employees are chalking up a 300 percent increase in the first two months of 1965 in support of the Division's Suggestion Awards program.

And cost conscious workers are reaping some just rewards for their efforts, too. Approximately $750 has been paid out for approved suggestions over the past six months.

Ken Geller, chairman of the Suggestion Award committee, reports employee enthusiasm "extremely encouraging.

"Increased operating effectiveness through employee participation in this vital effort is one of our key means of improving our competitive picture," Mr. Geller said.

Mr. Geller reported special programs in which pens, radios, extra cash, turkeys and special drawings for prizes were offered employees for their cost-saving ideas.

"But all the special programs in the world can not replace our most important asset—employee enthusiasm," Mr. Geller added. "We are off to a good start. Let's keep up the good work. We all have a stake in the results."

NORCOM Production Now In Full Swing

Design and production of NORCOM communications equipment is in full swing at Northrop Nortronics' Anaheim facility as a result of recent contract awards totalling over $600,000. The majority of systems are for installation at new NASA facilities.

The Nortronics intercom systems will provide operational communications for the pre-test, test and post-test activities during static testing operations of the Saturn booster.

LEARNING FREE ENTERPRISE—Joyce Jennings, 17, vice president of sales for the Conejo Designers and Producers, lights a Christmas candle, one of the products manufactured by the Junior Achievement company of Thousand Oaks.

SALES INCREASE; NORTHROP BOARD SETS DIVIDEND

Northrop Corporation board of directors has declared a 25 cent quarterly dividend, payable March 20 to shareholders of record March 4.

Covering the six months ended January 24, financial figures show increases over those for a similar period one year ago.

Consolidated net income was $4,020,000, up from $3,274,000. Earnings are the equivalent of approximately 98 cents per share on 4,219,532 shares, up from 78 cents per share and 4,205,822 shares. Sales were $159,797,000, compared to $144,008,000. Company backlog was $360,476,000, up from $349,487,000.

T-38 Safety Mark Tops List of News From Other Plants

An all-time flying safety record for supersonic Air Force aircraft and participation in an important technical conference were among events featuring Northrop products and people recently.

Norair Division's T-38 Talon trainer during 1964 wrote a new record into Air Force books for the operation of supersonic aircraft—only 2.9 major accidents per 100,000 flying hours. The Air Force-wide average for all types of aircraft, including helicopters, was 4.4!

This marked the third straight year the T-38 has finished at the top in flying safety laurels.

An unmanned spacecraft meeting sponsored by the American Institute of Aeronautics and Astronautics in Los Angeles found many Northrop men in key roles.

Richard E. Horner, Roy P. Jackson, Milton Beilock, John B. Gustavson, and Herbert Reich topped the list of active participants from NSL and Norair.

MANNED GEMINI FLIGHT SET; VENTURA ASSURES RETURN

IT'S TRUE—NASA's Hank Blazer (far right) goes over parachute once again with Ventura Division Quality Control men John Simpson and Stan Nutter to confirm initial fabrication without defect—involving three and one-half miles of stitching—of Apollo Project landing equipment. NASA's Tom Hughes (far left) congratulates Fabric shop General Foreman Ted Szostek on the job, which involved 400 man-hours of errorless work.

Landing System Carefully Fitted For Nose Cone

Ventura Division's parachute landing system for the Project Gemini program draws one of its most important assignments late this month when it returns America's first two-man spacecraft to an Atlantic Ocean recovery area after three orbits around the earth.

In this first manned flight since conclusion of the National Aeronautics and Space Administration's Mercury program, Astronauts Virgil I. (Gus) Grissom and John W. Young will be rocketed aloft from Cape Kennedy aboard a Titan II launch vehicle.

Less than seven minutes after lift-off, the Gemini spacecraft will be injected into the first of three planned orbits around the earth. At the end of the flight, approximately 4 hours and 45 minutes later, the spacecraft retrorockets will be fired for re-entry through the atmosphere.

At approximately 50,000 feet altitude, the parachute landing system will take over. First the astronauts will deploy the 8.3-foot drogue parachute to assist in stabilizing the descending vehicle.

At 10,600 feet, the drogue will deploy the 18-foot Ringsail pilot parachute, which in turn pulls out the main 84-foot Ringsail landing parachute.

The landing is scheduled for an area of the Atlantic Ocean, northeast of Grand Turk Island in the Bahamas. As with the Mercury astronauts, Gemini spacecraft will be recovered by Naval forces cruising in the landing area.

Two other Northrop Ventura parachutes also will be aboard the Gemini spacecraft but it is hoped these will not be needed. These are the personnel parachutes provided each astronaut for escape from the spacecraft in case of emergencies which may occur near the earth's surface.

The Gemini main landing system is produced under contract to McDonnell Aircraft Corporation, principal spacecraft contractor to the NASA Manned Spacecraft Center.

Employees Credit Union Declares 5.4% Dividend

A dividend of 5.4 percent for the second half of 1964 was declared recently by the board of directors of the Northrop Ventura Employees Federal Credit Union.

At the 10th annual meeting of the Credit Union membership, outgoing Treasurer Earl Krock announced that the organization now has $856,000 in assets with approximately 1200 members.

The second half dividend, coupled with the 4.3 percent paid for the first six months, brought the total 1964 dividend to 4.85 percent for the year.

Johnnie Via was elected president of the Credit Union for the coming year. Florence Johnson is the new vice president; W. H. Young, treasurer; and Audrey Gore, secretary.

Earl Morgan, Bill Bryan and Bill Johnston were elected assistant treasurers. The new officers also comprise the board of directors.

Members of the credit committee are: Dorothy Taylor, chairman; Eleanor Hendry, Paul Lawrason, Hal Kornell, and Ed Perry.

SUCCESSES NOTED

Conejo J-A Holds Open House

The youthful operators of a successful Thousand Oaks business firm held public open house recently in observance of Junior Achievement Week.

The local J-A firm, operated by Thousand Oaks High School students, is Conejo Designers and Producers. It has been in business since last October under the sponsorship of the Ventura Division of Northrop Corporation.

During the first half of the Junior Achievement year, the firm manufactured and sold holiday candles for the Christmas season with a reported healthy return on the stockholders' investment. The company operated initially on the sale of 100 shares of stock at $1 each.

Since Christmas, a research and development program has turned the company's efforts toward production of flare kits designed for use by motorists who have trouble on the highway. At the end of the school year, the company will be dissolved and the proceeds distributed to the stockholders.

Chief advisor to the group is Edward S. Babcock, Northrop Ventura Finance department administrator, who was awarded a citation last fall for many years of Junior Achievement work. Mr. Babcock recently transferred to Northrop Space Laboratories at Huntsville.

The Thousand Oaks youngsters have been guided through their week-to-week manufacturing and merchandising operations by three other Northrop Ventura advisors, Richard Davis, Doug Sessions and Douglas Finch. Mr. Davis now has taken over the job of chief advisor.

The Junior Achievement firm, the only one operating so far in Ventura County, is among 188 such miniature companies which observed Junior Achievement Week January 24 to 30 in Southern California. More than 3400 students representing 75 high schools this year are involved in the Junior Achievement program in Southern California.

Assisting the youngsters in business, production and sales are 560 men and women who voluntarily give their time as advisors. The program is designed to give young people direct experience in the operation of America's free enterprise system.

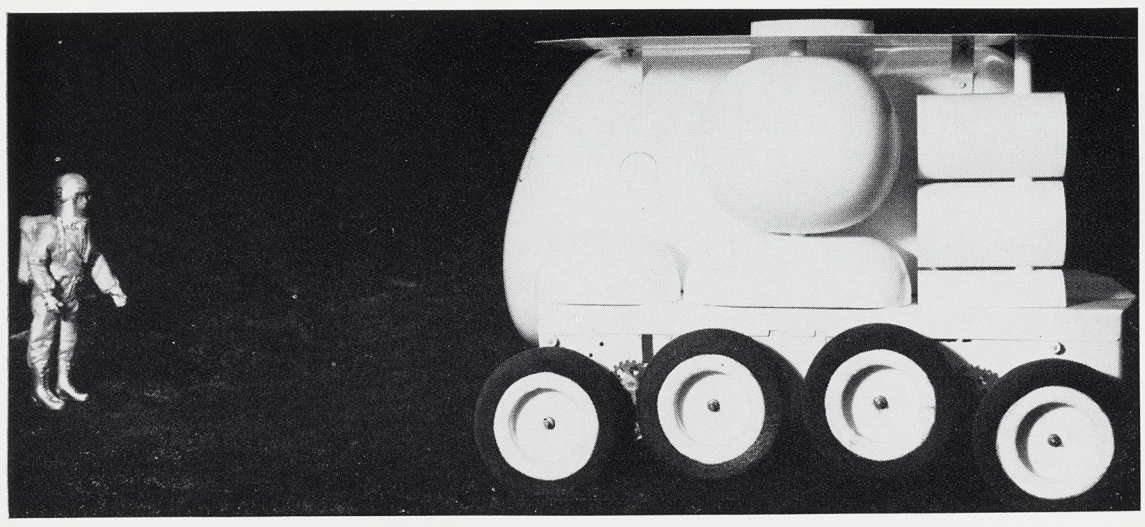
Ventura Division Slates Blood Drive

Donor cards were distributed to Ventura Division employees last week in preparation for a bloodmobile visit April 28.

Tri-County Blood Bank, Inc., the collecting agency for Northrop Ventura, will set up its facilities in the assembly room of the Administraiton building.

Since the agency maintains national reciprocity with Blood Bank Agencies, employees and their immediate families may receive free blood anywhere in the U.S.

Northrop Adventures In Outer Space

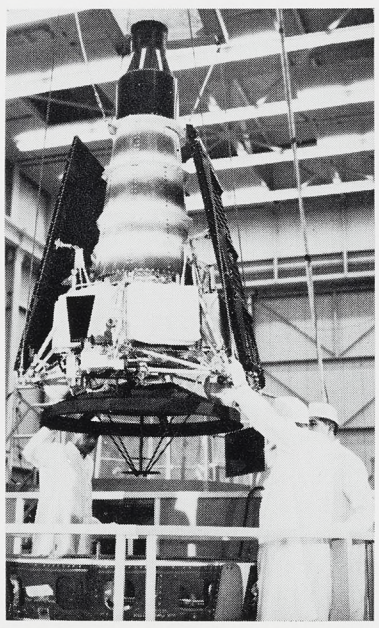


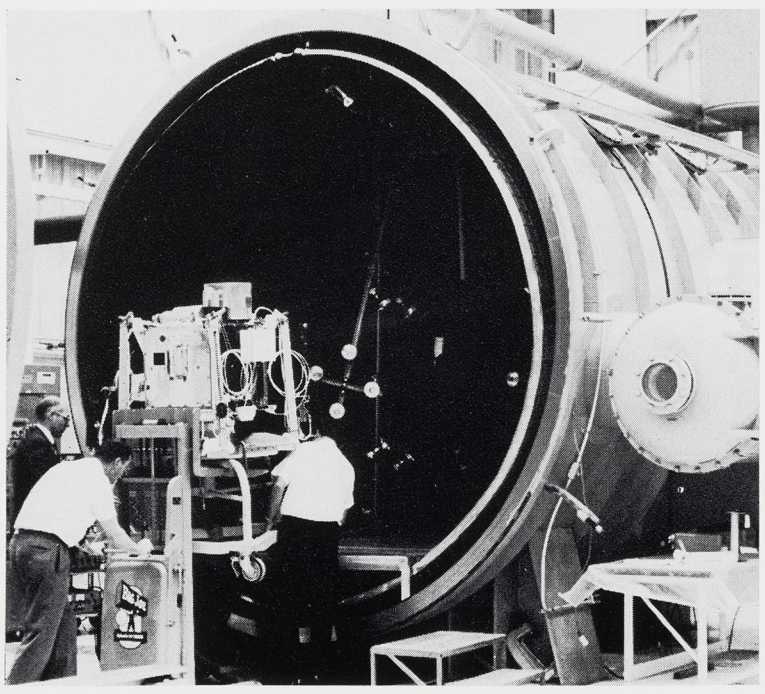
LUNAR SIGHTSEERS

Northrop Space Laboratories, using photos returned to earth by Ranger VII, has constructed one-sixth scale section of lunar surface at Hawthorne to test its choice of a lunar surface vehicle (LSV). Special lighting effects (above) simulate harshness of moon environment. Bill Sponsler (right) is inventor of LSV propulsion system, described as "Walking Beam Suspension." Scale model also got tryouts over earth desert terrain (below). NSL selected the mobility system after four years of research.

TRAVEL BUREAU

Development of space programs depends upon collection of accurate data, such as moon photographs provided from Ranger missions. The success of Ranger VII mission made it possible for NSL to develop LSV, only one of many projects helped by photos. Ranger VIII (right, shown at Jet Propulsion Laboratory) took even better pictures, according to JPL. Nortronics Division and NSL has provided continuing technical support to Ranger program. OV2-1 satellite, which is being tested at NSL (below), will conduct 14 environment experiments when launched into orbit on Titan III-A flight.





NSL Studies Mobility for Moon Team

In a chilly, all-black room at Northrop Space Laboratories, an eerie drama of life on the moon unfolds periodically for the benefit of scientists studying surface mobility systems for use by space travelers after they have landed.

Using a Ranger VII photo as a guide, NSL engineers have built a one-sixth scale replica of a 60-by-90 foot patch of the moon's surface, complete with mountains, craters and rubble.

Top billing in the drama goes to a Northrop-developed lunar surface vehicle (LSV)—the result of four years concentrated evaluation of different mobility systems.

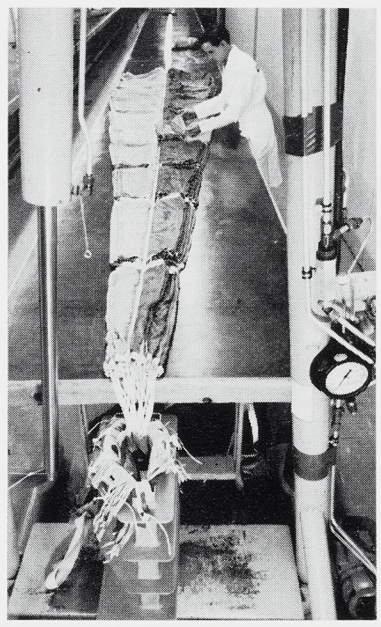
With its eight individually powered wheels attached in pairs to pivoted beams, the scale model LSV makes its way across terrain so rugged and treacherous that it is unimaginable by modern freeway drivers.

Called the "Walking Beam Suspension" by its inventor, Bill Sponsler, the mobility concept is now the focal point of the NSL study.

The complete show on NSL's 10-by-16 foot mockup includes astronauts made to scale and lighting effects which simulate special problems created by harsh solar and reflected earth light.

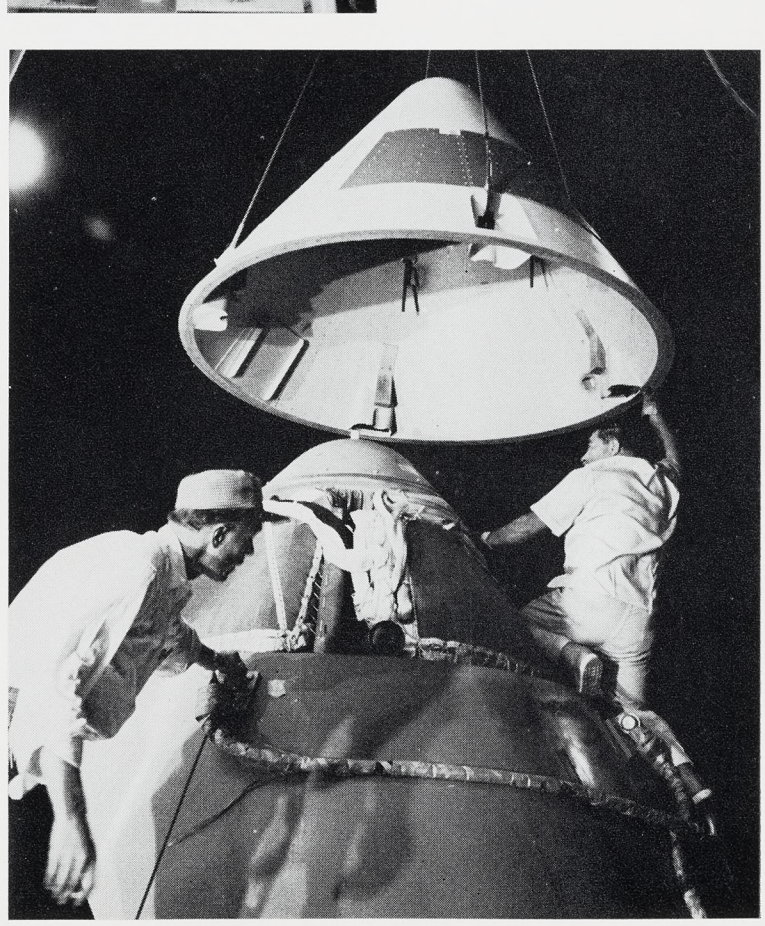
Because of unfiltered light striking the moon's surface, there

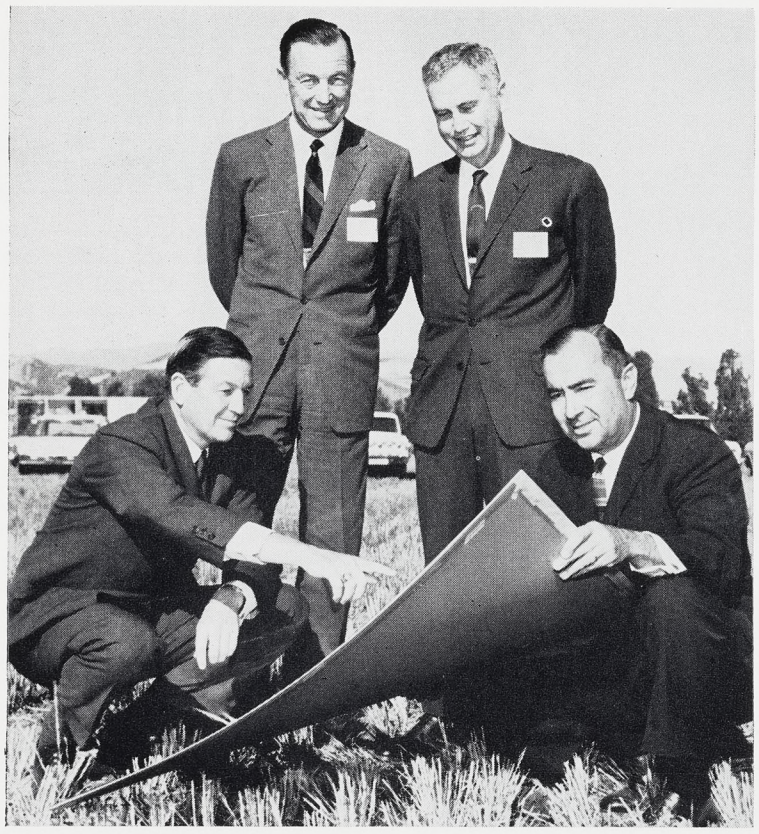
(See LSV, Page 3)



ROUND TRIP

While NSL scientists are studying surface mobility, Ventura Division is preparing for a major development this month in its program to assure astronauts their trips will be two-way. In packing landing system for first manned Gemini flight, Ventura technician (left) arranges and inspects 84-foot diameter parachute before hydraulic pressure equipment packs the material. Landing system (below) is part of the Apollo moon program, another Ventura Division project.





OFFICES GO RIGHT THERE—Northrop's wholly-owned subsidiary, Northrop Architectural Systems, is currently in midst of $1.6 million expansion of offices, production facilities. Looking over plans at site are, from left, Robert Haynie of Hass and Haynie, Thomas V. Jones, Northrop president, Henry E. North, jr., NAS president, and Albert C. Martin, jr., of Albert C. Martin and Associates. New site is in City of Industry.

Architectural Systems Expanding Facilities

A $1.6 million expansion project by Northrop Architectural Systems has gotten under way in the City of Industry, where construction of new production and office facilities is two months along.

Occupancy is scheduled for early July, according to NAS President Henry E. North, jr.

The wholly-owned subsidiary of Northrop Corporation manufactures sliding glass doors, aluminum exterior wall units, windows, storefronts and entrances, and sun control systems. NAS is presently located in the City of Commerce.

Plant capacity will be increased 40 percent when the 300 NAS employees move into the new, 150,000 square foot building.

Facilities are being installed to enable NAS to perform process steps, such as anodizing and surface treatment of metals, which presently must be subcontracted, Mr. North said.

Another prominent feature will be a straight-through manufacturing capability. Pieces of metal entering the plant will not change direction until processing is completed and the product is shipped or placed in inventory.

In further describing the new facility, Mr. North pointed out that as a result of many new efficiencies NAS expects to reduce certain basic production costs.

Located on a 17-acre plot, NAS will have more than twice the acreage of its present location.

LSV

(Continued from Page 2)

are no gray areas. Shadows are completely black and could cause faulty perception, NSL engineers say.

But even with such an adverse environment, the Walking Beam Suspension has been proven exceptionally reliable and maneuverable. Use of "scuff" steering techniques allows the vehicle to turn on its own centerline. Astronauts could make a full 360-degree observation turn before moving in any direction.

In comparative tests with conventional steering mechanisms, the scuff technique proved better in more than a dozen applications, NSL Engineer Sponsler said.

Individually powered wheels and rotating beams allows the LSV to literally pull itself up as much as four feet to clear obstacles. It can also span crevices as wide as seven feet.

A life support cabin, designed to provide a shirtsleeve environment for LSV crews, is another unique feature of the vehicle, NSL reported.

NSL engineers also have worked out special air locks, fuel tank mounts, a vacuum workshop, communications and guidance systems, radiation and micrometeoroid shielding, and space for carrying scientific equipment.

Designed for a two-man crew to conduct two-week exploration missions, the Northrop LSV is considered by NSL to be ideal for Apollo moon landings, but has other possibilities for planetary surface use.

Management Systems Is Topic As Divisions Attend Seminars

An unusual insight into modern approaches to management systems was afforded 78 key management representatives taking part in a series of seminars completed recently at Norair.

Joining Norair participants by special invitation were men from the Corporate office, Northrop Space Laboratories, Ventura and Nortronics Divisions.

Called "Aerospace Management—Change and Challenge," the three seminars were presented by the Management Systems Corporation's Center for Executive Development. Coordinator was Norair's L. H. Walton, administrator of Education and Training.

Seminar participants were selected by top Division management.

Department chiefs and directors took part in two 40-hour seminars during January. A briefer, 15-hour version of the same material, was presented Norair executives during February.

Each session took the form of "case studies" related to the latest Department of Defense and Air Force Systems Command directives and newly issued Army, Navy and NASA requirements. Particular emphasis was placed on new trends in program management and business change.

F. W. "Bob" Lloyd, Norair vice president and assistant general manager—Operations, spoke at one final session, while J. G. Macdonnell, treasurer and manager—Finance, addressed another.

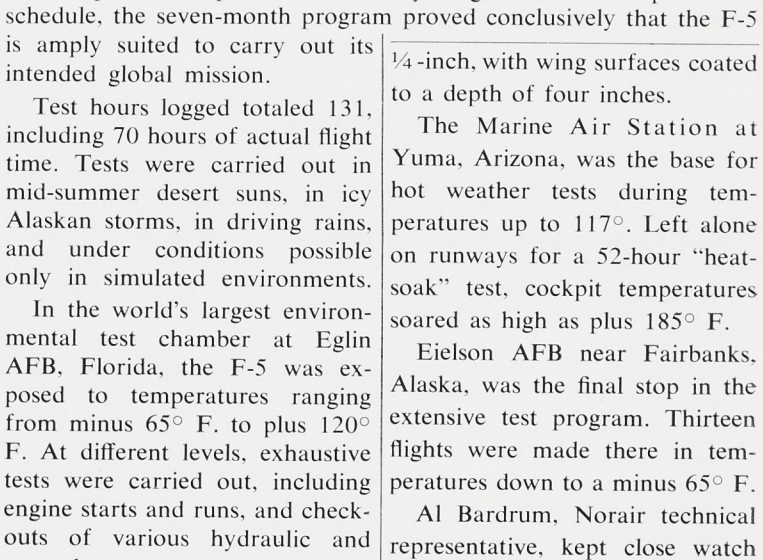
Final Merit Test Set for Saturday

Final reminder to all Northrop Corporation parents with students interested in National Merit Scholarships to be given in 1966 was issued this week.

Last NMSC tests qualifying students for consideration will be given Saturday at high schools participating in the program.

Arrangements to take tests must be made by the student with the school. Primarily, the tests are for students who are now juniors and will be graduating in 1966.

Detailed information on the program is available through high school offices.



LIKE SNOW BUNNIES—Norair's Al Bardrum (left), technical representative, and Ken Baird of General Electric smile before F-5 as pilot, Major N. C. Evans, climbs aboard for one of 13 cold-weather flights made from Eielson AFB, Alaska.

Fighter Withstands Weather Extremes

Every type of adverse weather which nature could provide or man could improvise was used for extreme temperature tests of Northrop's F-5 supersonic tactical jet fighter. Just completed on schedule, the seven-month program proved conclusively that the F-5 is amply suited to carry out its intended global mission.

Test hours logged totaled 131, including 70 hours of actual flight time. Tests were carried out in mid-summer desert suns, in icy Alaskan storms, in driving rains, and under conditions possible only in simulated environments.

In the world's largest environmental test chamber at Eglin AFB, Florida, the F-5 was exposed to temperatures ranging from minus 65° F. to plus 120° F. At different levels, exhaustive tests were carried out, including engine starts and runs, and check-outs of various hydraulic and control systems.

Another step in the three-phase program centered at Wright-Patterson AFB, Ohio, where ground, taxi and flight tests were conducted during rainstorms and icy weather conditions.

A unique test sent the F-5 to altitudes between 16,000 and 20,000 feet to fly behind an aerial tanker releasing water spray. Ice buildup on jet intakes measured ¼-inch, with wing surfaces coated to a depth of four inches.

The Marine Air Station at Yuma, Arizona, was the base for hot weather tests during temperatures up to 117°. Left alone on runways for a 52-hour "heat-soak" test, cockpit temperatures soared as high as plus 185° F.

Eielson AFB near Fairbanks, Alaska, was the final stop in the extensive test program. Thirteen flights were made there in temperatures down to a minus 65° F.

Al Bardrum, Norair technical representative, kept close watch on the test planes at all locations, and Flight Test Engineer Bob Thomas participated in the Alaskan tests.

Major N. C. Evans of Wright-Patterson AFB ferried the F-5 to and from Alaska and flew test missions.

MANAGEMENT SYSTEMS MESSAGE—F. W. "Bob" Lloyd, Norair vice president and assistant general manager-Operations, addresses participants in one of three management systems seminars just completed. Seventy-eight key management men, including representatives of all divisions and the Corporate Office, took part. Seminars offered rare insight into modern approaches to management systems and concentrated on latest DOD, military and NASA directives.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Florence & Figueroa or Florence & Hoover, Los Angeles. Lyman Doster, ext. 2075, 1324, PL 8-5621. 2

8 a.m. — 4:45 p.m.

Inglewood Ave & 134th Pl. Hawthorne. Dorothy L. Muzik, ext. 2123, 2470, OS 6-0790. 5

Crenshaw Blvd. & 180th, Torrance. Bonnie Condon, ext. 618, 323-4342. 5

Rides Offered

8 a.m. — 4:45 p.m.

Crenshaw Blvd. & 180th, Torrance. Bonnie Condon, ext. 618, 323-4342. 15

The Impact of Science: Lifelong Education

By C. M. WONG, Ph.D.
Chief, Norair Structures and Auxiliary Systems

It has been said that 95 percent of all the scientists who have lived during the period of recorded history are alive today. As a result of their efforts during the past two decades, the level of understanding of the physical world in which we live and the ability to put this understanding to work have progressed at a phenomenal rate.

In turn, the degree of complexity of our way of life seems to have increased exponentially. The impact of new knowledge made available by the rapid progress in science and technology has been felt by all of us. There seems to be an unending need for new tools, methods, skills, and philosophies to cope with the tremendously complicated problems of this generation.

In the face of these demands, the need for education is greater than at any previous time in history. In order that we may equip ourselves and our children for the challenging tasks of the future, we must take full advantage of all of our educational opportunities, both formal and informal.

Dr. Wong

It is clear that we could never learn all there is to know about the world we live in. In order that an accumulation of knowledge will not be random, we must, in my opinion, strive for an ultimate goal. This goal may be immediate or it may be in the future. For most of us, it is perhaps better that our goals be definable in terms of a job to be done or an attainable objective to be reached. Most people prefer to see the results of their labors and to find in the attainment of specific objectives the reward and encouragement necessary to continue striving for greater accomplishments.

Very few of us can continue to be motivated by curiosity alone, as perhaps a theoretical mathematician might be while developing sophisticated theories which may not be proven or become useful in his lifetime.

Education can be achieved in many ways, and we must make maximum use of all of them if we are to equip ourselves for the challenging tasks of our lifetime. I would like to discuss some of these forms or modes of education as I see them.

1. **FAMILY EDUCATION:** Notwithstanding an extremely busy professional career in the Government of the Republic of China, my father managed to slice a considerable amount of time from his heavy schedule to personally inspire his children. He encouraged each of us to be curious, outstanding in achievement, and to contribute to God and mankind. I feel that as parents we all owe our children not only the benefit of our educational background but the encouragement to exceed our accomplishments, educationally speaking.

2. **FORMAL EDUCATION:** In the ordinary sense, this mode of education concerns training for pre-planned curricula and schedules received from an establishment we call school. Although there are diverse qualities or grades of the same degree awarded from many academic institutes, usually the higher degree indicates a greater effort or deeper concentration. A higher degree is always preferable, but it is not the only criterion demanded of us in order that we be capable of fulfilling our job requirements. Strong common sense, sound judgment, and fairness to everyone, to complement the knowledge acquired in the pursuit of our degrees, are the keys to success.

3. **INFORMAL EDUCATION.** The completion of our formal education should by no means be the end of our educational program. The commencement exercise in the formal institute is only a pause in the long educational journey. This informal mode of education may not take a standard or rigid form. We are constantly being influenced by people, environment, and other things around us. Never underestimate the power of your fellow workers. In my experience, they are among the best teachers in life.

4. **UNIVERSAL EDUCATION:** This mode of education may be the most significant of all for the individual, for it includes the experience gained from the job and the techniques developed through all forms of education. Since we are living in a constantly changing world, we must continue learning to meet the world's challenges. Not only is continued learning a rewarding activity, but the more we learn the more we discover there is to learn.

5. **BROAD EDUCATION:** We should never overlook general and broad basic training as we master our professions. In order to be a well-developed human being, one should not concentrate his attention and efforts in one particular field alone; instead, he should become interested in other areas of education—for example, in art, international affairs, and politics. Nor can one have a complete education without personal discipline. My family's determination to live according to principle, to choose the less easy way, has contributed enormously to our disciplined capacity for getting things done.

"Harvest comes from effort, patience, and sacrifice," as one of my countrymen said many years ago. Strong commitment and determination are needed in the attainment of one's educational goals because the process of learning is like rowing a boat upstream. If we do not continue at a reasonable rate of speed, we do not advance, and we are in peril of being pushed back. We can never remain stagnant or stationary in our world of rapidly advancing technology. If we stop learning, we stop living — and the world and nature will not sympathize with those who have no desire to improve themselves.

REAL SPLASHING OCCASION—Captain William G. Bookout, USAF instructor pilot at Reese AFB, Texas, recently became that base's first man to log 1000 hours piloting Northrop T-38 Talon trainer. Fellow pilots and others greeted him on arrival and had him run a water bucket gauntlet. He became sole member of the new 1000-hour T-38 Club there.

Parents Key to Learning Through Life, Wong Says

One of Northrop's most educated men likens education to rowing a boat upstream. If a person doesn't continue to row at a reasonable rate of speed he not only will not advance, but is in peril of being pushed back.

And Dr. C. Ming Wong, chief of Structures and Auxiliary Systems at Norair Division, believes that parental influence is the first and foremost element in the success of an individual's lifelong education.

The parents' responsibility is more than just providing opportunity for children to go to school, Dr. Wong feels: the parent must impart the basic tools of learning — values, logic and discernment.

"My father, with love and firmness, trained us in the classics and the classical tradition," Dr. Wong said, "and he taught us to organize our thoughts.

"He spent many hours on the subjects of values, logic and discernment, and his influence is still most important. Without this parental atmosphere, educational processes — especially in the advanced degrees—become difficult, often impossible."

Now a parent and a Ph.D., Dr. Wong has written a summary of his views (which appears on this page) on education, at the request of the NORTHROP NEWS.

Born and raised in pre-Communist China, Dr. Wong need only to point out his family's educational record to emphasize the effect of his father's influence. Of the 12 Wong children (11 boys and 1 girl), all have college degrees, and all graduated with honors.

After earning a degree in mechanical engineering from Southwest University (1942) in his homeland, Dr. Wong emigrated to the United States to fulfill his ambition for an advanced degree.

Education is not a luxury, Dr. Wong says, but an obligation—an obligation to self, to country, and "as the Chinese see it, to one's honorable parents."

Technical Veterans Get New Posts

New assignments for two Norair veterans have been announced by W. E. Gasich, vice president and assistant general manager—Technical.

R. E. Kosin, formerly of the X-21 Program, has been named technical assistant to Mr. Gasich.

B. F. Collins, special assistant to Mr. Gasich who has worked with Marketing on Navy sales programs, has been re-assigned as assistant to J. C. Cassell, director of the F-5 Program.

T-38 Veteran Gets Honor— Water Deluge

An unusual initiation—a water dousing — greeted the initial Air Force pilot at Reese AFB, Texas, to log 1000 hours at the controls of the Northrop T-38 Talon trainer.

Captain William C. Bookout found fellow pilots, students, ground crew members, maintenance personnel, and even a few passers-by, amply armed with "loaded" buckets as he taxied in after passing the 1000-hour flight mark.

Then he got it!

An instructor pilot assigned to the 3501st Pilot Training Squadron since 1960, Captain Bookout becomes the sole member and presiding officer in the exclusive 1000-hour T-38 Club at Reese AFB.

At Reese his T-38 flying experiences are legendary. Last October he brought a T-38 home safely after a mid-air collision near Lovington, New Mexico.

Anaheim Finishes First Aid Class

Initial group of Nortronics-Anaheim employees to complete a special Red Cross First Aid training course received certificates recently from Production Chief Grant Gunderson.

All volunteers, the trainees attended special one-hour sessions one day a week for a nine-week period. Sessions were held immediately after the conclusion of regular work shifts.

Instructor was Officer Lee Bratten of Security and Plant Protection group.

Graduates included Pete Falk, Paul Engstrom, Howard Campbell, Sol Del Grasso, Tom Boswell, Jim Donovan, Eddie Robertson, Jack Kinzer, Walter Hoppe, Tom Runnels and Ralph Jenkins.

Additional courses in the same subject as well as medical self-help offered through the Anaheim Civil Defense office are being studied. Interested personnel may contact Safety Engineer Bill Cornett, ext. 615, to enroll. Classes will be scheduled as interest warrants, Mr. Cornett said.

RARE SIGHT, INDEED—While Norair folk know the F-5 from the "ground up," few have an opportunity to see it painted, marked and armed because this production step is handled in Palmdale. Recently, the F-5B (shown above), and F-5A were on display at Hawthorne where they were viewed by some 5000 employees. Director of Flight Operations Bob Elder (left) chats with John Fritz, test pilot, and Les Gebro, inspector, after arrival of planes.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

TV, 24″ Packard Bell, remote control, maple cabinet, $130. Pacoima, 882-0761. A

Shotgun, Winchester auto., model 50, 20 ga., deluxe polychoke & recoil pad, $85. L.A. 47, PL 6-0015. A

Valiant Station Wagon, 1962 V-200, air, cond., new tires, r/h, auto. trans., $1295. Lomita, DA 6-6214. A

Garbage Disposal, deluxe model, $30. Gardena, 679-3927. A

Station Wagon, 1950 Ford V-8, p/s, new tires, $850. Gardena, 324-5961.

Encyclopedia Britannica, deluxe White Ed., $30 dn., take over $14 mo. pmts., $315 bal, P. V. Estates, FR 5-5097. A

Lawnmower, 3 hp, rotary, gasoline, $25. P. V. Pen., 377-5319. A

Auto Tow Bar w/auto. brake control, $25. Hawthorne, 675-1031. A

Sewing Machine, $35. Hawthorne, OS 5-1057. A

China, Easterling, Damask pattern, 4 5-pc. place settings w/creamer & sugar, platter & lge. bowl, $100. El Segundo, EA 2-0678. A

Golf Clubs, starter set, $25. Beverly Hills, CR 6-4879. A

TV, 23″, remote control, $95. Torrance, FR 1-2526. A

Radio, exec. model 100 CB, $150. Torrance, DA 5-3724. A

Outboard Motor, Scott, 10 hp, incl. 6-gal. remote gas tank, Bail-A-Matic, trolling plate, $100. Inglewood, 671-4986. A

AQUARIUM, 10-gal. w/stand & equipment, $35. Hawthorne, OR 1-1660. A

Student Desk, natural finish, $15. Long Beach, GA 3-1363. A

House, 3-bdrm., 2-bath, GE kitchen, patio, fireplace, landscaped, fruit trees, near schools, 1600 sq. ft., $42,750. Rolling Hills, 833-9747. A

Falcon, 1960 4-dr. sedan, r/h, new w/w tires, $450. Hawthorne, OS 6-3912. A

Pontiac Catalina Station Wagon, 1959, 9-pass., r/h, w/w, under 50,000 miles, $995. Gardena, 323-6894. A

House, 3-bdrm., 2-bath, all elec., in Fallbrook area, incl. 6½-acre avocado grove, $15,000 dn., $61,000. San Pedro, 831-0063. A

Photo Mural, 40″x60″, framed, black & white, San Francisco night scene, $10. Torrance, DA 5-5245. A

Acreage, 5, level, in Lassen Co., Calif., $1150. Box 201. A

Falcon Station Wagon, 1962 deluxe, fully equipped, auto., 30,000 miles, Torrance, $1335. DA 6-5558. A

Coin Books, set of 12 green books by Meghrig, $7. Hawthorne, 679-1992. A

Chord Organ, small, $40. Torrance, 325-1204. A

Monza, 1963 coupe, r/h, auto. trans., 15,000 miles, $1450. Inglewood, PL 4-7861. A

Sofa Set, $7. Lawndale, FR 1-8590. A

Motorcycle, 500 sgle., 1954 Velocete, recently o/hauled, new paint, $200. Hawthorne, OS 6-4923. A

Chrysler, Windsor, 1956, 2-dr. h/top, r/h, auto. trans., $295. Torrance, 371-8701. A

Organ, Lowrey, Heritage model, full keyboards w/upper & lower manuals, vibrato-sustain tabs, $1000. Inglewood, PL 5-0137. A

House, 3-bdrm., redecorated, covered patio, 2-car gar., lge. yd., near El Camino Col., $23,000. Torrance, OS 5-2522. A

TV, color, 21″, Danish modern console, Packard Bell w/UHF, 1-yr-old, walnut, $350. Beverly Hills, CR 5-7341. A

Record Player & Radio, Zenith, 4-spd., auto., portable, mahogany, $35. L.A. 5, 384-4017. A

Ice Box, 18″x24″x48″, $10. Torrance, FA 8-3306. A

Pontiac Catalina Station Wagon, 1960, $50 & take over pymts., $1150. Hawthorne, 322-6430. A

House, 3-bdrm., family rm., 2-bath, GI loan, $110 mo., near school & shopping, $29,500. Redondo Beach, FR 6-6415. A

Washer, GE auto., $75. Hawthorne, 676-8279. A

Boat, 25′ Owens, 1959 model, s/s radio, depth finder, sleeps 4, $3500. Huntington Beach, 897-3436. A

Stove, apt-size, 3½-yrs-old, $30. Inglewood, 676-2958. A

Electronic Flash, ultrablitz Monojet II, 40 watt secs., rechargeable Nicad battery w/charger & ac cord, $35. Los Alamitos, GE 1-4233. A

Trumpet, Olds studio w/case, $135. Redondo Beach, FR 5-2789. A

For Sale

Falcon Station Wagon, 1961, 4-dr., deluxe, auto., r/h, new tires & shocks, $975. Torrance, DA 5-7705. A

End Table Set, mahogany, $19. L.A. 43, AX 1-3778. A

Outboard Motor, 1960, 40-hp, Elgin, long shaft, $200. Lynwood, NE 1-6933. A

Stove, Western Holly, built-in cook top & oven w/broiler, stainless steel, $100. Torrance, 325-5559. A

Chevrolet, Bel Air sport coupe, 1957, new paint & tires, $600. L.A., GR 4-9790. A

Chevrolet, 1955, new brakes & tires, r/h, $350. Manhattan Beach, FR 2-0307. A

Stenograph, mfd. by Hedman Co., $65. Torrance, 327-8582. A

Love Seat, custom-made, print slipcover, $50. Manhattan Beach, FR 9-2068. A

Freezer, Frigidaire, chest-type, $75. Manhattan Beach, FR 2-0720. A

Couch, French provincial, $85. La Habra, 714-879-8724. A

Metro Sedan, 1957, over 30 mpg., $350. Hacienda Heights, 336-3453. A

Apt Bldg., deluxe, 4-unit, 6-mos-old, 1 blk. from Northrop, $71,000. Hawthorne, 676-6134. A

Surfboard, Sweet, 9′, $50. Hawthorne, OS 6-8887. A

Lot, Inglewood Park Cemetery, double interment, $910. Hawthorne, 672-1036. A

Couch & Chair, brown leather recliner, $150. San Pedro, TE 1-4960. A

End Table Set, mahogany, round, leather top, $25. P. V. Pen., 377-5075. A

Bedroom Set, walnut, nite stands, chest of drawers & dresser, $295. Lawndale, 676-3050. A

House, 4-bdrm., family rm., 2-bath, 1/3 acre, pool, landscaped, 3-yrs-old, low dn., $38,900. Northridge, EM 3-1679. A

Buick, 1957, fully powered, $275. L.A., 753-5129. A

Pup, Chihauhua, 3-mos-old, AKC & shots, $35. Torrance, FR 1-2705. A

Chevrolet Impala, 1961, 2-dr. h/top, air cond., Powerglide, $1595. Pomona, 593-5720. A

Bicycle, Girl's 26″, $20. Gardena, DA 4-8853. A

Television, Zenith table model w/stand, $25. Inglewood, PL 5-4497. A

MGA, 1960, 2 tops, recently o/hauled, r/h, good tires, $1100. Box 202. A

Mags, American, for 14″Chevrolet wheels, $105. Lawndale, OS 5-4305. A

Corvair, 1961 700 Deluxe, 4-dr., auto trans., r/h, $750. P.V. Pen., FR 7-3649. A

BMW, 1964, 2-cyl., 2 carb, 2 coils, 42 mpg, w/w, Porsche trans., sport cpe., $845. Tarzana, 345-1649. A

Air Conditioner, Fedders, ¾-ton, 110 volt, $35. Hawthorne, 676-1018. A

Olds 88, 1961 4-dr. h/top, r/h, Hydra., p/b, p/s, p/w, 4-way seat, fac. air, orig. owner, $1525. Downey, TO 9-6163. A

Crib, w/pedic mattress, blonde,$28. Gardena, 327-2279. A

Austin Healey 100-6 Standard, 1959, new paint, $950. P.V. Estates, 377-6658. A

TV, 23″, Zenith w/remote control, 2-yr-old, console walnut, $119. Hawthorne, OS 5-7938. A

Duplex, 2 bdrms. ea. side, dble. gar., $21,500. Yucaipa, WH 1-0856. A

VW, 1955, sun roof, 1961 eng., $500. L.A. 8, 291-7715. A

TV, Zenith, 16″ UHF-VHF portable, used less than 4 hrs., $100. Playa del Rey, 398-3018. A

Rambler American 220, 1964, 2-dr., 6-cyl., stick, 7400 miles, $1350. Granada Hills, EM 3-8838. A

Colt, 357 mag., also shoot 38 special, w/holster, $60. Gardena, DA 9-5359. A

Bicycle, Schwinn Varsity, 10-spd., $40. Fullerton, 529-3158. A

Chevrolet 6 Biscayne, 1962, r/h, 4-dr., stick, $995. Huntington Beach, 714-962-3834. A

Home, 3-bdrm., patio, thermo heat, near schools & shopping, $26,500. Culver City, EX 1-4106, UP 1-0959. A

House, 3-bdrm., 2-bath w/utility rm., 35′ living rm., P.V. stone fireplace, lge. fenced yd., $21,500. Walteria, 378-7742. A

Runabout, 14′, w/steel trailer & spare wheel, $40. Granada Hills, EM 0-2483. A

Sprite, 1959, $600. Torrance, 371-0768. A

Sunbeam Alpine, 1962, $1295. Arcadia, 445-3009. A

Dodge, 1958 station wagon Sierra 9-pass., new tires, o/hauled, p/s, p/b, $500. Torrance, 320-2827. A

Lawnmower, Garden Queen, hand-type, 4-yrs.-old, $5. Calabasas, 889-8091. A

Chevrolet, 1951, 2-dr. sedan, r/h, Powerglide, smog device, $200. L.A. 49, 472-2031. A

House, 3-bdrm., family rm., 3-bath, 2000 sq. ft., corner lot, incl. living rm. furniture, $43,750. San Pedro, TE 1-2973. A

House, 3-bdrm., block fence, corner lot, 1 blk. from school, 3-yrs.-old, 1½-bath, covered patio, $22,750. Long Beach, TE 4-7823.

Surfboard, 8′ 6″ Lyman, $35. Torrance, DA 5-0309. A

Luggage Carrier, leatherette, encl. bottom zippered front, lge. size, $15. Torrance, 370-4101. A

Dodge Dart 270, 1964, fully equipped, $200 dn. & take over pymts., $2000. Van Nuys, DI 3-8055. A

For Sale

House Trailer, 1957 Transahome, 8′x40′, 2-bdrm., incl. 2 porches, fences & 4′x8′ storage bldg., 12 minutes from Northrop, $1850. Gardena, 323-6102. A

Wanted to Buy

Baby Furniture in good condition. Torrance, FA 0-3782. B

Patio Table, wrought iron, glass preferred, expanded metal acceptable. 328-8181. B

For Trade

House, small, on 50′ x 150′ R-2 lot, trade for duplex or 2 houses on one lot. 376-8545. C

Gold Dredge, 20 cu. yds. per hr., 5 hp, Briggs, air & reserve for 2 divers, many extras, trade for late model 10-hp or more Johnson outboard eng. Redondo Beach, FR 8-2609. C

Rentals Offered

Apt., 1-2 bdrm., air cond., stove & refrigerator, $110-125. Studio City, PO 3-1024. E

Apt., 1-bdrm., closed gar., laundry fac., $89. Torrance, 714-892-7440. E

Apt., unfurn., 2-bdrm., 2 children o.k., 20 min. from Northrop, carport, laundry rm., $90. Lynwood, 635-3784. E

Apt., 2-bdrm., furn., upstairs, gar., 5 min. from beach, $120 mo. Hermosa Beach, FR 2-5985. E

Apt., 2-bdrm., 2-bath, pvt. patio, laundry rm., gar., fences, 1165 sq. ft., $165 mo. Torrance, 375-1766. E

Apt., 3-bdrm., furn. or unfurn., $115-$130 mo. Eastview, TE 1-3737. E

Apt., 1-bdrm., unfurn., walking distance to Northrop, water & trash pd., $92.50. Hawthorne, 676-1678. E

Apt., unfurn., 2-bdrm., near South Bay Center, $95 mo. Redondo Beach, 376-4978, 374-4317. E

House, 2-bdrm., 1½-baths, 2-story, decorated, unfurn., $125. Manhattan Beach, FR 4-8608. E

Studio Apt., unfurn., 3-bdrm., 2¼ baths, soundproofed, pvt. patio, closed gar., $170 mo. P.V. Estates, FR 5-0867. E

Apt., 1-bdrm, unfurn., garage, close to Northrop, $90 mo. Torrance, DA 9-0314. E

House, 2-bdrm., water & trash pd., children o.k., no nets, $105. Lawndale, 371-6775. E

Sleeping Rooms, pvt. entrance & bath, utilities furn., close to Northrop, $45 mo. Lawndale, 676-7328. E

House, 2-bdrm., stucco, redecorated, near Northrop, $105. Lawndale, OS 5-9695. E

Exec. Apt., 2-bdrm., 2-bath, 1500 sq. ft., by appt., $160. Inglewood, 373-1143. E

Apt, 3-bdrm., 2-bath, pvt. patio, serv. room, fireplace, forced air heat, avail. April 1, near Norair, $180 mo. Hawthorne, 679-1358. E

Personals

To All our wonderful friends of Northrop Norair, Nortronics, & the AFPRP group, we thank you most humbly for your kind expression of sympathy in the loss of our beloved mother. MAXWELL G. & OLIVER W. PELLERIN. L

I Wish to thank all my friends at Northrop for their kind expressions of sympathy at a time when it was deeply appreciated. MRS. HUBERT DUNSTON. L

I wish to express my appreciation to my friends at Northrop for their sympathy & kindness. ELMER E. JUNGCLAS. L

Obtain pvt. pilot's license as part owner of late model aircraft. Rolling Hills Estates, FR 7-3810. L

For Sale or Trade

Chevrolet Impala, 1964 s. s., 4-spd., pos. traction, $2150 or trade other car for my equity. Hawthorne, OS 6-7417. M

Gene Browne Met Jack Northrop As 12-Year-Old, Asked for Job

Gene Browne was 12 years old when he first met Jack Northrop and asked:

"Sir, when I learn a whole lot more about airplanes—and I will—do you think you might give me a job?"

The time was the late 1920's, and Mr. Northrop had just finished addressing a youthful assemblage of model airplane clubs in Glendale. As program chairman for his club, Gene had arranged for Mr. Northrop to speak that day.

Now a senior technical specialist in Design Integration and 24-year veteran at Norair Division, Gene recalls that it was more than 10 years before he became personally involved with the Northrop name again.

But during that period, he never lost his interest in airplanes. Immediately upon graduation from high school in Glendale and Glendale Junior College, he attended the fledgling aircraft training center—Curtiss Wright Tech.

Aircraft provides large portion of the Gene Brownes' leisure.

Gene possessed meticulous hands, the tools of an expert draftsman. He is also a perfectionist, and no task has ever been too small to warrant the utmost concentration and exacting detail.

He joined Hughes Aircraft Company as a member of a 14-man engineering group which was designing a twin-engine fighter for the Army Air Corps.

Here he learned for the first time the bitterness of defeat.

"We lost that contract," Gene said, "but we were still proud of our showing in rough competition." The design that beat Gene's group became the P-38.

Next came a fling at consulting. When no one seemed to require the services of a consultant aeronautical engineer, he moved to North American Aviation at El Segundo where he worked on the DB-7 and the A-20, of which 7000 were built in World War II.

In 1940 he became a Northrop employee.

Since that date, Gene has had a hand in designing every flying product to bear the Northrop name—the N-3PB, the Flying Wings, B-35, B-49, the XP and P-61, XP-56, XS-4, the T-38 and the F-5. Along the way there has been work on the Hawk missile, plus proposals, studies, mockups, and many other assignments.

Special highlights of Gene's long career include work on the first full power control system in the industry (for the B-35).

"There was only the power boost system prior to that time," Gene said. "Northrop opened the door on the use of servos and hydraulics to do the complete job, and the big switch was on."

Six patents have been issued for Gene's innovations by the U. S. Patent Office and one by the British Government, all in the field of improved control systems.

One fact about control system developments that amazed Gene is the remarkable "staying power" of cables, which are still in use just as they were on the first aircraft. But he reasons that electronic systems for controls are just around the corner. They would possess self-tuning characteristics keyed to flight environment.

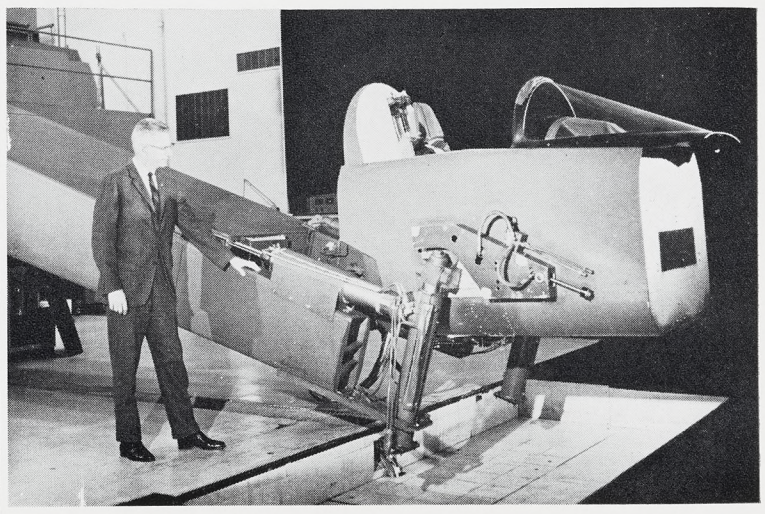
"When electronic systems for controls are finally perfected, they will be automatic in the fullest extent," he reasoned. "Then the pilot will be along to manage the flight more than anything else."

Computers are making engineering tasks much easier in design fields and are helping save millions of dollars, Gene added. He pointed out that the Northrop dynamic flight simulator with its six degrees of freedom makes it possible for computers to tailor aerodynamic controls to the mission and environment before the system ever becomes airborne.

As a seasoned pilot himself, Gene has been in a good position to contribute to the Northrop reputation of manufacturing a "pilot's airplane"—honest craft distinguished for flight handling responsiveness and the utmost compatibility between man and machine.

He has logged more than 450 hours in the air and was a charter member of the old Northrop Flying Club. He now belongs to the A&E Flying Club, composed of Northrop and STL employees.

In looking back over his career (which is still very active), Gene is never at a loss for stories to tell his seven grandchildren. But one of his favorites will always be that day in Glendale when a patient and knowledgeable man took the time to answer a youth's eager questions.



And aircraft is Gene's profession, which spans three decades.

Competition, Prospects for Future Told

While warning that future competition will be tough and shifts in direction will be rapid, Northrop President and Chairman Thomas V. Jones told the Nortronics Division Management Club last week that he has no doubts about an expanding future for the Corporation, the aerospace and defense industry and the United States.

Addressing a meeting at Long Beach, where the first slate of officers was installed by the new Club, Mr. Jones emphasized new challenges and opportunities for Northrop's diversified divisions as a result of recent shifts in defense and space spending.

"I am not one of those who is doubtful about the future of our industry, or our company," Mr. Jones emphasized. "I am not trying to paint a rosy picture. Realistically, competition will be tough and the shifts in direction rapid. Some companies will be more successful than others.

"I think there is a great deal of vitality in the technical concept—in the technical philosophy—that we have developed at Northrop. Namely, that the country needs to move in the direction of simpler solutions, less complexity, more economy, and an ability to do the job at less cost," he added.

Mr. Jones spoke of a vast "potential" in the export market and indicated Northrop planned to pursue it vigorously.

Mr. Jones added that recent realignments in the Corporate structure will provide operating divisions with sound approaches to realistic and competitive costs and to marketing approaches that are realistic in a highly competitive environment.

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NORTHROP HOSTS DISCUSSIONS ON OPPORTUNITIES

Northrop Corporation, an original signer of the 1961 Plan for Progress, last week hosted a special conference to further the national program.

Basically, the Plan for Progress is a voluntary effort of defense industry firms to encourage and support Equal Opportunity Employment. Each firm coordinates its in-house efforts and supports the national effort as needed.

William Larrabee, Corporate vice president—Industrial Relations, was host at the March meeting. Attending were Industrial Relations directors from all Northrop divisions as well as invited guests from other aerospace firms.

Special participants were P. B. Lewis, administrative director, and Don M. Thomas, administrative coordinator, Plan for Progress, Washington, D.C.

Air Force Pilots Fly F-5s to Sweep In Gunnery Meet

A United States Air Force gunnery team flying the Northrop F-5 won all four events at the recent Luke AFB, Arizona, "Bull's Eye II" gunnery meet.

Four F-5s competed against five F-100 teams with 20 aircraft and two F-104G teams with eight aircraft. Events were skip bombing, dive bombing, rocket firing and ground gunnery.

An Air Force source evaluating the meet noted that the winning F-5 pilots averaged less than 80 hours experience each in the aircraft versus hundreds of hours for pilots of the competing aircraft.

West Point Pick

Edward S. Babcock, jr., son of Edward S. Babcock, until recently Northrop Ventura Finance administrator, has received a nomination to the U.S. Military Academy at West Point.

COLUMNIST GOES AIRBORNE—Art Buchwald, national syndicated columnist, gives out big grin as he climbs aboard Northrop T-38 for orientation ride at Edwards AFB, California. His "chauffeur" was Major Bob Rushworth, USAF, one of the X-15 research plane pilots. Mr. Buchwald reported experience as "one of my most thrilling moments."

Stitchers Stump Inspectors With Flawless Parachute

TWO MILLION STITCHES — Experimental Fabric Fabrication group (above) turned out a perfect parachute on the initial attempt, marking the first time in Ventura Division history that Quality Control inspectors haven't found a minor defect.

Quality Control inspectors — whose job it is to discover any flaws in fabrication of products — are still shaking their heads with awe this week over a recent job by the Experimental Fabric Fabrication group at Ventura Division.

In putting together a parachute for the Apollo landing system, a team of 24 men and women made close toow million perfect stitches in the nylon fabric.

Although the chutes are always perfect when they leave the Newbury Park facility, this is the first time a perfect product has been turned out on the initial assembly, according to Stiles Burke, chief of the Fabrication group.

In addition to the three and one-half miles of stitching, the perfect 84-foot wide chute required two miles of tape and webbing, one and one-half miles of suspension lines and 700 yards of 42-inch nylon sails.

Just to prove the first job wasn't a fluke, the same team turned out a 127-foot wide parachute without a single defect a week later.

General Foreman Ted Szostek and Foreman Bob Barcena headed the fabrication team which included:

Lena Conti, Darlene Shoemaker, Carmen Penninson, Carol Regalado, Bobbie Taylor, Florence Lojewski, Mary Helen Garcia, Shirley Woodall, Esther Huggins, Nellie Cook, M. E. Garcia, Dolores Caldera, E. C. Parker, Linda Wagner, Peggy Jones, Wileen Willson, Mary Jankins, Lorraine Newton, Thursa Summit, Sue Amison, Rosie Basva, and Nelda Freymond.

Retiring Ruth Tonkin Looks To Creative Writing Career

Miss Ruth Tonkin's plan for the most immediate future is to sleep late every morning. Then she's going back to school to explore a new career in creative writing.

That first ambition is a logical one. In late January, Miss Tonkin retired after 20 years of secretarial work in Northrop's Ventura Division.

Miss Tonkin

"For a long time I've had to get up at five o'clock every morning to get to work," she said with a smile. "Now I'm just going to sleep late in the mornings for a while."

Miss Tonkin lives with her mother at 7944 Oakdale Ave., Canoga Park. Her years of work span almost three-quarters of the history of Northrop Ventura and its predecessor, Radioplane Company.

Ruth came to work in 1945, starting in the Purchasing department, and that same year became secretary to the chief engineer, a job she held until 1954. For the past 11 years, she has been secretary to John R. Jacobsen, first in Engineering and then in Planning.

Although she may sleep late for a few mornings, Ruth's natural vitality and interest in life will deny her a sedentary retirement.

"I've been taking some courses in creative writing," she said, "and I plan to continue those. I want to write fiction, and possibly get into television script writing."

"The work has been interesting and challenging," she said. "It was especially gratifying when we received new contracts that I had worked on. The people here have always been wonderful to work with."

WWV Radio Sets Top Standard, but Listening Is Dull

Lab technicians of the Reference Standards Operation at Nortronics' Metrology branch are probably the only men in the Company who can play their radio at any time of the day.

They are limited to one station, however, the listening is an important part of their work in calibrating instruments which measure frequencies and time.

Station WWV, operated by the National Bureau of Standards in Washington, D.C., broadcasts a continuous signal on a fixed frequency. By comparing the WWV signal with that of their own equipment, the Anaheim technicians can calibrate their instruments to the NBS standard.

However, it's pretty dull programming, one engineer said, and unless needed for a test the receiver remains shut off.

Astronaut to Speak At Ventura M-C

Astronaut Charles Bassett will address the May 3 meeting of the Ventura Division Management Club, it has been announced by Bill Green, Club president.

Mr. Bassett's talk on "Management in Action" will climax a day-long visit to the Conejo Valley facility for discussions on Northrop's participation in the Apollo and Gemini programs.

Girl Scout Troop

Members of Girl Scout Junior Troop 262, sponsored by Norair Northrop Recreation Club, have been working especially hard at an unusual activity in preparation for a public appearance.

The girls have taken up fencing.

F-5 SALES TOP $250 MILLION; 350 ON ORDER

Total sales of the F-5 supersonic fighter have passed the $250 million mark, with more than 350 of the Norair planes ordered to date.

Announcement by the Spanish Ministry of Air that it will place a $47 million initial order for 70 F-5 tactical fighters is the Company's latest order. Spain is making a direct purchase with its own funds to re-equip the Spanish Air Force. Spain selected the F-5 after a competitive evaluation that lasted more than two years.

Spain is the eighth country scheduled to receive the versatile F-5 for modernizing its air arm.

INTERNATIONAL INKING — Northrop-CASA agreement for production of 70 F-5s was signed recently in Madrid. At table are Northrop's Irving Roth and M. G. Gonzalez (second and fourth from left), Norair's F. W. Lloyd (second) and J. S. Breneman (right), are among those standing.

There's a Lot of Life Left in Drones...See Page 3

NORTHROP NEWS

NORTHROP VENTURA

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Ventura Adds Radomes to Product Line

An independent research and development program in composite materials has led to Northrop Ventura's first contract for the manufacture of radomes and has excellent planned potential as a major product line, according to John Kerr, director of Product Engineering in the Production Operations department.

"While contract details cannot be announced at this time," Mr. Kerr said, "we are proud to say that we have had excellent results in all phases of testing, and that our achievements have aroused a great deal of enthusiasm among radome users."

The radome, which actually is as old as radar, is a protective cap on guided missiles or aircraft. It protects radar guidance systems against heat and rain, and actually becomes a part of the system through its electromagnetic characteristics.

Less than a year ago, when Mr. Kerr and a four-man Production Operations team launched the program, high speed missiles were encountering operational difficulties in rainstorms and in situations where high frequency was required for guidance.

The Northrop Ventura radome offers excellent protection from both rain erosion and heat of high speed flight and takes a wide band of radar frequencies with outstanding transmission properties, Mr. Kerr said this week.

"And our product is less than one-half the weight of existing designs," he added.

These made-to-order characteristics are possible through development of a ceramic cap backed up by themo-setting plastics.

Ceramic material provides the

(See RADOME, Page 6)

NARROWING THE FIELD—As blast-off time nears at the Cape, responsibility for safe recovery of Gemini astronauts narrows from the scores of manufacturing and inspection personnel at Ventura Division to the one man who packs the parachute. Larry Richardson (kneeling above), Northrop Ventura representative at the Cape uses hydraulic equipment to pack chute for Grissom-Young flight.

New Destroyer Class to Use Northrop Test Equipment

A $7.3 million contract for automatic test and checkout systems has been awarded to Nortronics Division by the U.S. Navy Bureau of Ships.

Designated TEAMS, for Test Evaluation and Monitoring Systems, the equipment is designed to assure continuous operation of critical electronic equipment aboard a new class of destroyer escorts.

The system will provide on-line monitoring of up to 10 major electronic systems aboard each vessel. The Bureau of Ships contract covers design, production and installation of the checkout systems aboard the ships.

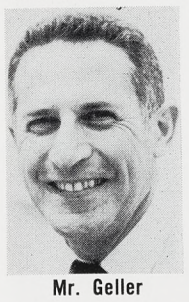
Units will be similar to Northrop DATICO automatic checkout systems, which monitor Polaris missile system readiness, W. P. Van Ordstrand, program manager, said this week.

Manufacturing is scheduled for the Anaheim plant, following successful design and tests of a pre-production unit, he said.

Cutting Costs With a Smile

Here, There, Everywhere Is Ken Geller

Ken Geller is a gregarious, one-man "group" who, if asked to define his duties, could sketch out an elaborate organizational chart which covers a number of specialized activities ranging from industrial relations to salesmanship.



Mr. Geller

As Value Analysis engineer, his influence touches upon most all Operations activities at Ventura Division. Everywhere he goes his purpose is the same—cut costs.

Most important among Division methods for reducing costs is the Employee Suggestion Award program, administered by a special committee headed by Mr. Geller and including Industrial Relations Director Rex Fairless, Bud Montag of Finance, Dick House of Engineering, and Carl Zettersten of Planning and Manufacturing.

Mr. Geller "tramps around the Division 10 times a day," to discuss suggestions with employees, to check out trouble spots and to promote attention to improved efficiency and cost cutting.

The committee processed 467 suggestions in 1964, a 300 percent increase over 1963. Highlight of the year was "S Week," which resulted in 100 suggestions in five days.

Once a suggestion is found to be a potential means of cutting costs, Ken becomes a salesman in presenting a proposal to the different areas of management which would be affected by the change.

Added incentives have come from unusual promotions, such as a drawing held last year for pens, turkeys, free lunches, and many other items. To be eligible, an employee had to submit a bonafide suggestion for reducing costs.

Early indications in 1965 are that the program is not letting up after the record year. In January and February more than 50 suggestions were processed by Mr. Geller and program committee.

Frequently he is called upon for assistance by administrative departments as well as production.

Northrop Reps Share in Twin Cape Successes

Jubilant technical representatives of Ventura and Nortronics Divisions and Northrop Space Laboratories were sharing congratulations at Cape Kennedy Wednesday after 72 eventful hours climaxed by the near perfect Gemini space flight Tuesday.

At the moment a Northrop Ventura parachute system was settling astronauts Virgil Grissom and John Young in their Atlantic Ocean recovery area (only 25 miles off target), Ranger 9 was a little more than 50,000 miles from impact on the moon.

When Ranger 9 soared off in a perfect launch atop an Atlas-Agena rocket Sunday, a Nortronics/NSL team was present. Tuesday morning Ranger 9 was virtually assured of success after a ticklish mid-course maneuver was completed as scheduled.

Six Northrop Ventura representatives were on hand for the two-man Gemini flight, delayed one day because of the Ranger shot. Thousands of other Northrop employees were able to keep posted (along with the rest of the world)—via all network television—on the Northrop built landing system as it gently delivered astronauts Virgil Grissom and John Young to their Atlantic Ocean landing area.

While there were five parachutes in the Ventura system, only three were required for the landing. An 8.3-foot diameter drogue was deployed by mortar at about 50,000 feet altitude after the craft completed its three orbits and reentered the earth's atmosphere.

At 10,600 feet, an 18-foot

(See CAPE, Page 6)

Virgil I. (Gus) Grissom, half of America's first two-man astronaut team, tries on personnel parachute harness specially tailored for him by technicians at Ventura Division.

Score of Venturans Trek to Palmdale To See Seats in F-5

Norair's Palmdale facility recently hosted a score of Ventura Division Manufacturing personnel who wanted to know how the pilot seats they manufacture for the F-5 and T-38 aircraft are used.

Ventura Division's J. R. Andrews, supervisor of Seat Assembly, and Jack Lind of Material Control made the arrangements with E. G. Patt, chief of Production Services at Palmdale.

While the F-5 and T-38 are manufactured at Hawthorne, final assembly, including installation of seats, production test flights, and delivery to the Air Force are functions of the Palmdale facility.

The tour was scheduled after working hours, and a number of Norair supervisors returned to the plant on their own time to act as guides.

NVRC TO "CHRISTEN" NEW MEETING PLACE

The Northrop Ventura Recreation Club will celebrate the opening of the Division cafeteria for night time club activities with their first annual Spring Dance April 3.

Industrial Relations Representative Bob Wilson announced this week that modifications to the cafeteria have been completed to allow outside entrance to the facilities.

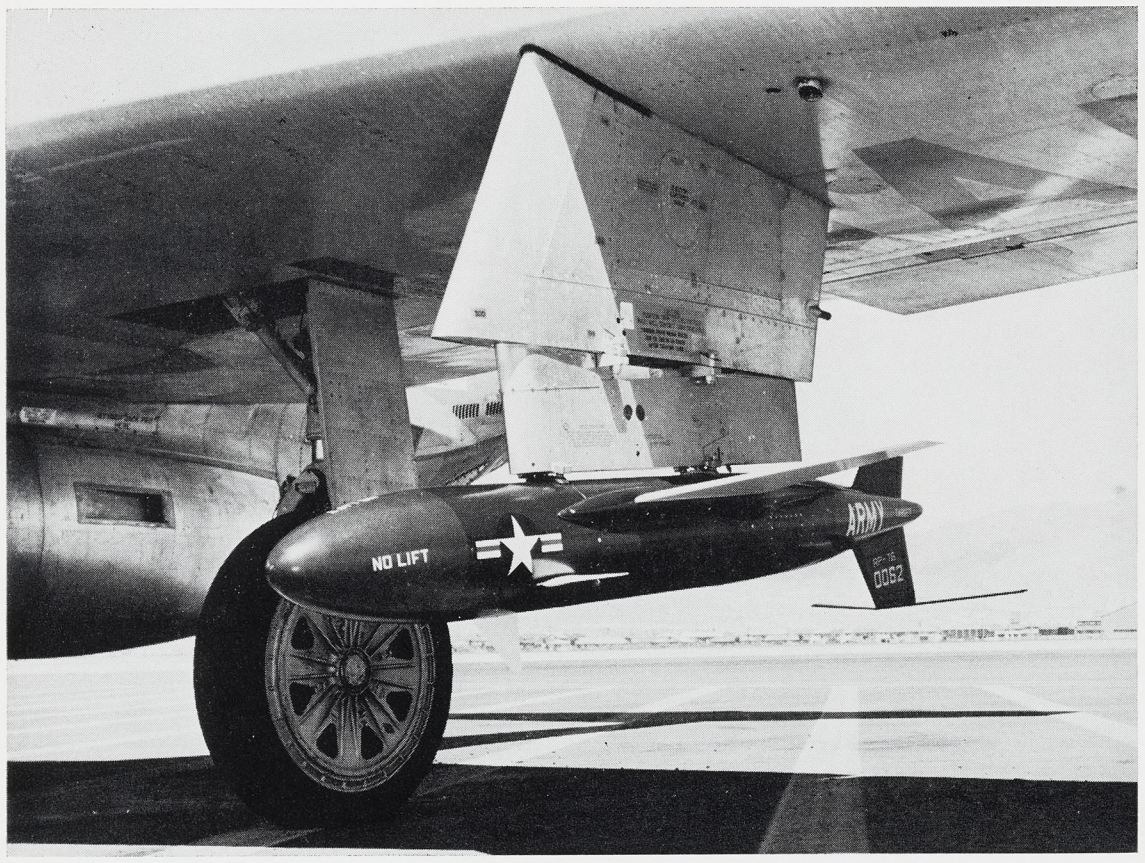
NVRC President John Lawrence reports that 10 door prizes, worth approximately $10 each, will be given away at the dance.

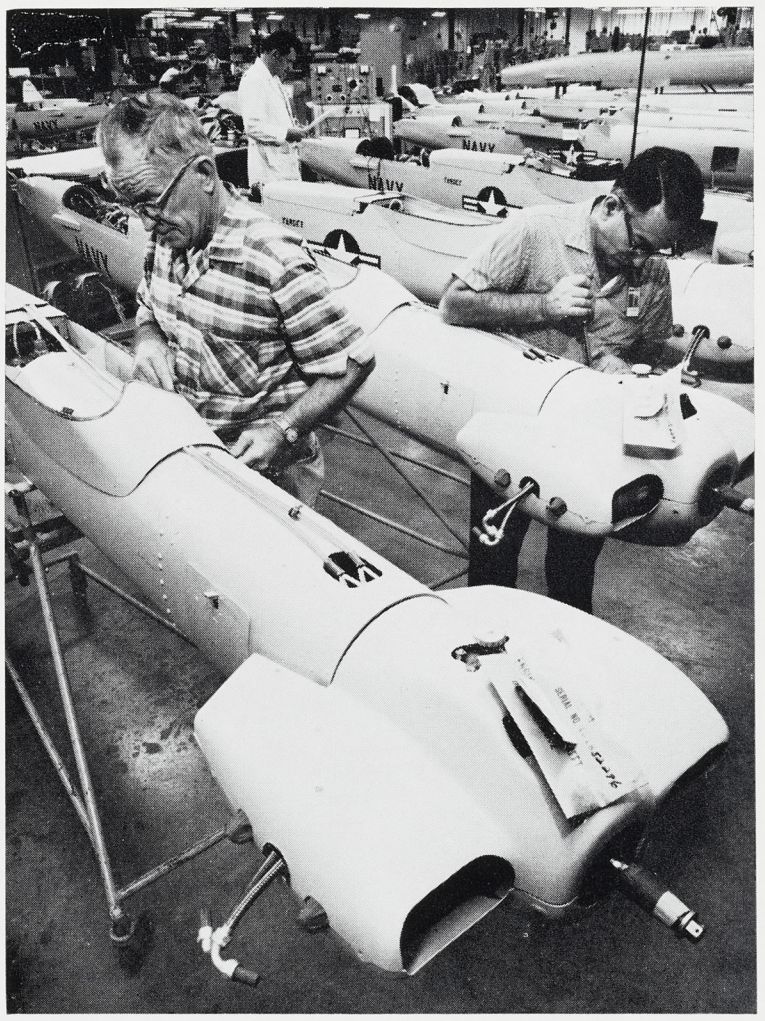
DEADLINES FOR NEXT EDITION

News, Features	March 30
Club Activities	March 31
Photos	March 31
Classified	March 31

Further details on who to see, how to see them on page 5.

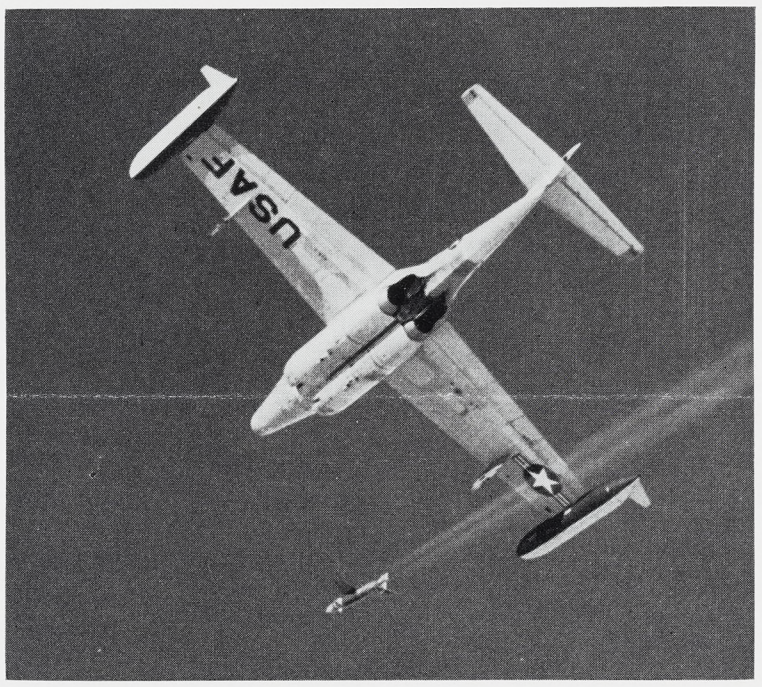
Ventura Target Service Emphasizes Realism





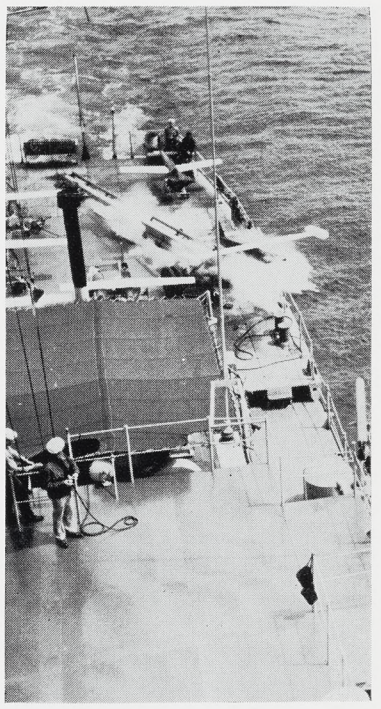
DRONE NESTING

Ready for air launch, the AQM-38A rocket-powered target missile (above) will be launched at altitude in order to provide realistic training for U.S. Army Nike and Hawk crews. Formerly designated RP-76, the Northrop Ventura target is radio controlled and recovered by parachute. Target is launched (right) and while only 10 feet long, it will simulate enemy bomber on radar screen of alerted missile crew on ground down range. Ventura Division not only produces the aircraft, but provides complete flight service including launch, recovery and maintenance.



'CARRIER' BOUND

Fuselages of KD2R-5 drone, popular Navy target, near completion (above) at Ventura Division. Special launcher gets propeller-driven target airborne (right), and another is moved in to take its place (below). The KD2R-5 and AQM-38A are only two of a family of radio-controlled drones produced at Northrop Ventura's Conejo Valley facilities.



Story on Page 3

NOSE CONE FOR A DRONE

Nose cone for AQM-38A emerges completely finished from hydraulic press in the plastics manufacturing section of Ventura Division. The target missile is built entirely of plastic except for its control system and solid propellant rocket engine.

Steady Sales Are Forecast For Drones

There will continue to be a steady market for target drone aircraft as long as the military—both in the U.S. and abroad—maintains an arsenal of conventional weapons, according to Ralph Friesen, program manager for drone projects in Northrop's Ventura Division.

Mr. Friesen

Mr. Friesen currently is directing activities on a $903,000 follow-on contract with U.S. Army for production of the AQM-38A (RP-76).

As a high or low altitude aerial target for surface-to-air and air-to-air missile systems, such as the Army's Nike and Hawk units. the AQM-38A is now one of the primary products of the Ventura drone program.

Weighing 300 pounds and only 10 feet long, the rocket-powered AQM-38A can be carried aloft by fighter aircraft and launched from altitude.

Despite its compact size it simulates the radar cross-section of a full sized enemy bomber, providing the most realistic anti-aircraft training possible.

While the latest Army contract calls for production of the rocket drones, the heart of the Ventura program is its complete target flight service, in which Northrop supplies, maintains, flies and tracks the targets during military training exercises.

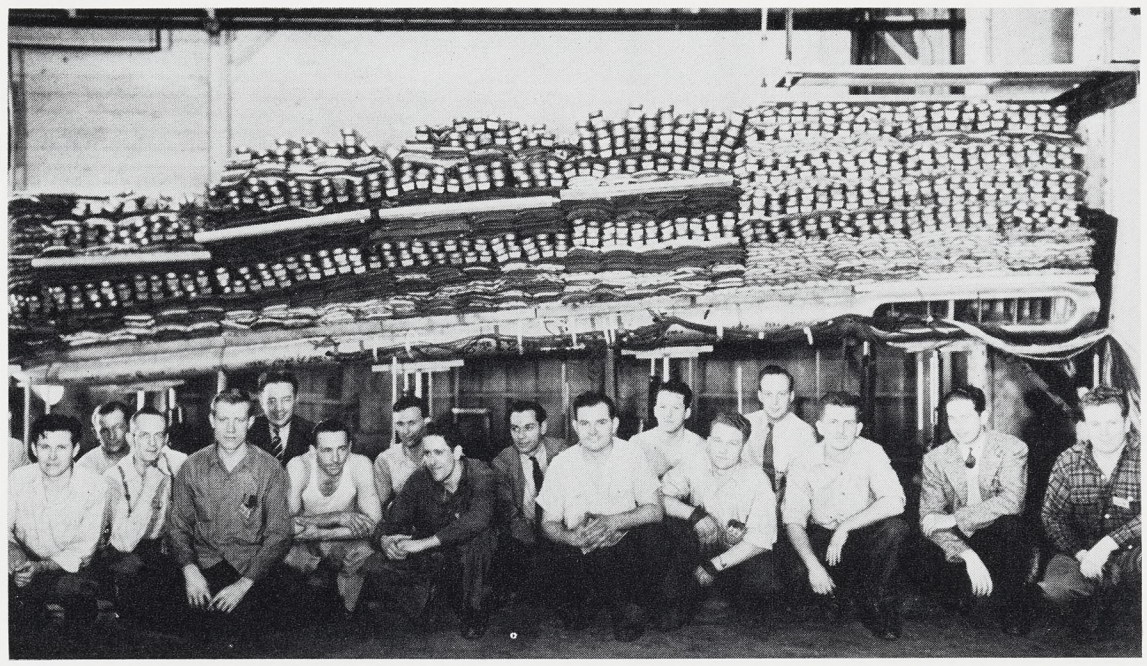
More than half of the rocket drones have been recovered and repaired for re-use since the operation was begun in 1958.

"This represents a tremendous savings to the Army," Mr. Friesen said, "and makes the AQM-38A the least expensive supersonic target system in operation today."

The AQM-38A is expected to remain a primary target for at least another five years, Mr. Friesen added.

Rod Hoover is supervisor of the newest AQM-38A contract.

REMEMBER WHEN?



AND TIME MARCHES ON — Airframe static tests at Norair yesteryear are shown in photo taken 20 years ago of P-61C outer wing panel. Kirksite pigs and shot bags (lead filled) on wing provided test loads. Weights on wing totaled 55,000 pounds. Four of men pictured are still with Norair. Can you spot Harvey Baker, Rollie Pontious, Lou Yancey and Ray Veverka?

PROGRAM SIMPLIFIED

F-5 Cinches Airframe Static Tests

Norair Division passed another major F-5 program milestone recently with the successful completion of extensive airframe static tests on both F-5A and F-5B configurations.

No significant incidents or failures of primary structures occurred during the program. In short, the airframes qualified without structural modification for 100 per cent of ultimate design, flight and ground handling loads.

Tests were performed in the Norair Engineering laboratories and date back to October 1963.

Requirements were established by the Structures and Mechanical Systems branch under Lou Yancey, chief. Stan Murnane of the T-38/F-5 Structural Analysis branch helped with test requirements and customer approval of test conditions and test results.

The F-5 static test program was carried out in an unusual manner in the interest of accelerating schedules and reducing costs, according to R. B. Jackman, chief of Engineering Laboratories.

Traditionally, aircraft static tests are carried out on complete aircraft (wings mounted to fuselage, etc.). Wing loads are reacted by fuselage loading distribution and vice versa for all major test conditions. This entails careful analysis of balancing loads and additional reaction control points to maintain load balance within acceptable limits. And tests must be performed in logical order with one completed before another can begin.

Norair conducted tests with the F-5 wing mounted on a fixed reaction structure utilizing fuselage attach points, eliminating the requirement for balancing reaction loads.

Conversely, fuselage tests were carried out in a similar manner on another fixed structure. Loads were reacted at the wing attach points.

Major conditions critical for the wing and fuselage interaction were tested with the wing and fuselage mated.

"This technique permitted conducting the entire test program in a relatively simple manner," Mr. Jackman said. "Final mated testing for critical conditions completed all test requirements."

Mr. Jackman pointed out new techniques saved Norair and its customers approximately 18 weeks and 4500 man-hours as compared with previously used test methods.

All F-5 components common with the T-38—ailerons, trailing edge flaps, horizontal and vertical tails, seats, various control systems — were qualified earlier during the static test program for the T-38A.

Similarity of the F-5A and F-5B allowed a single test program to satisfy major requirements for both configurations. Exceptions were forward fuselage tests on the two-cockpit configurations which were required to satisfy the F-5B test requirements only.

New Page Contract

The United States Army Materiel Command has awarded Page Communications Engineers, Inc., Northrop subsidiary at Washington, D.C., a contract valued at approximately $2 million for improvement of a troposcatter communications systems between Taiwan and Clark Air Base in the Philippines.

Richard L. Jones Named Research Director at Norair

Dr. Richard L. Jones has been named director of the Northrop Norair Research and Technologies section by W. E. Gasich, vice president and assistant general manager-Technical.

Dr. Jones reports to D. D. Warner, manager, Research and Development department.

Joining Northrop in 1961, Dr. Jones served as a senior research scientist in Materials Research group and since April 1962, has been chief of the Materials Research group.

Dr. Jones holds a B.S. (1952) in metallurgy from Wayne State University and earned his M.S. (1953) and doctorate (1958), also in metallurgy, from the University of Michigan.

BRATT, MIKUS GET TECHNICAL POSTS

W. E. Gasich, Norair vice president and assistant general manager-Technical, has named two men to new Technical posts.

R. W. Bratt, formerly of the Technical staff, is now project director, X-21A Project Engineering section, reporting to the manager, Dr. L. R. Fowell of the X-21A and M-2/HL-10 Program department.

Dr. E. B. Mikus was named chief of the Materials Research group, reporting to Dr. R. L. Jones, director of Research and Technologies section.

Radio 'Hams' Elect Holly Commissioner

Bob Holly has been elected the first commissioner of the new Northrop Ventura Amateur Radio Club.

Twenty - four — seventeen of which are licensed amateurs — employees gathered last week to charter the Club.

Other officers elected were Frank Bennett, vice commissioner; Lois Burmahln, secretary; and Don Daniel, activities manager. The Club has its own radio equipment and an operating fixed station on all bands.

Anyone interested in applying for membership in the Club can do so by attending one of the monthly meetings held at 11:30 a.m. in Room E166 or by calling any of the Club officers.

TICKETS GO ON SALE FOR DISNEYLAND NIGHT

Northrop Corporation's annual "Night at Disneyland" has been set for Friday, May 28, between 7:30 p.m. and 12:30 a.m.

This is second annual all-for-one affair sponsored jointly by Northrop Recreation Clubs. Last year 9500 people took part.

Here's how it works:

Tickets sell for $3.75 per person. They entitle the holder to admission and free use of all Disneyland facilities and attractions, exclusive of shooting galleries. So for one price an individual can avail himself to everything Disneyland offers, including dancing to a name band and admission to the world-famed Tiki Room.

Disneyland will be cleared of non-Northrop employees prior to the 7:30 p.m. time.

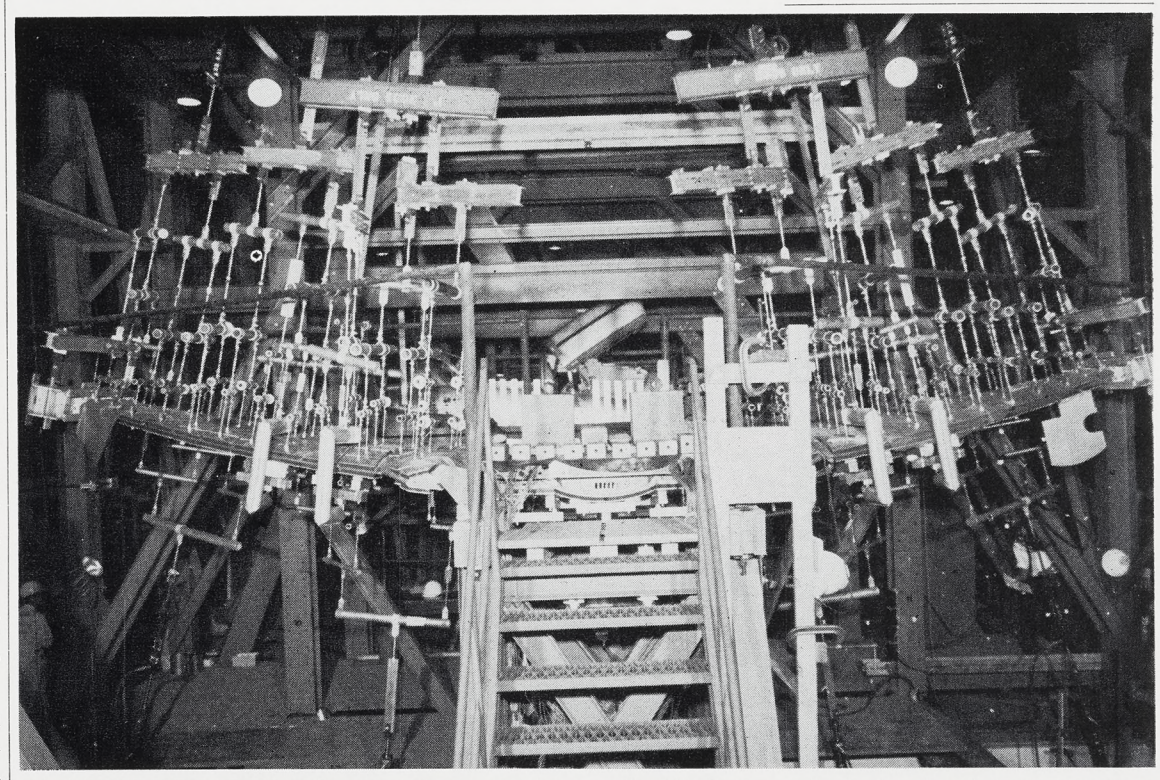
Because the May 28 date is a part of a long weekend (a holiday falls on Monday), advance notice is being given. Tickets went on sale this week at all Personnel Activities offices throughout Northrop Corporation.

CUSTOMER RELATIONS APPOINTS TAPPER

New senior Customer Relations representative at Northrop Norair is Thomas T. Tapper, according to Daniel Darnell, jr., manager of Customer Relations.

Mr. Tapper replaces Charles "Casey" Finnegan who has been re-assigned to the Flight Test section.

A 12-year Air Force veteran and rated pilot, Mr. Tapper is a former instructor pilot, member of worldwide champion AF gunnery teams and Korean combat pilot. He holds a B.A. degree in economics and psychology from San Diego State College.



CAN YOU FIND THE F-5?—Test fixtures make metal cocoon for F-5 during exhaustive airframe static test program just completed. This is final phase with wing and fuselage mated. Earlier test checked each separately. Tube-like units are part of whipple trees attached to bonded wing surfaces on one end, hydraulic cylinders on other. Cylinders, a part of loading system, are joined to elaborate instrumentation recording system to obtain pertinent stress and deflection data.

Northrop Donors Tops With Three Youngsters

Statistics covering the Northrop Blood program are common and oft-repeated.

Periodically, they tell of 300 or more volunteer donors turning out to give blood. Others tell how the program disburses from 20 to 25 pints each month to help all Northrop Corporation employees and members of their families who have a special need.

But there is another side to the program, a warm and human side often overlooked. It is the personal story of those who needed the assistance of the program and found it ever-ready to help.

Such is the story of three Northrop youngsters.

Sally Vigil, 12, Laura Jean Maki, 11, and Tommy Bates, 9, have never met. Chances are, they never will.

However, they share common bonds. Each is vitally occupied with the pursuits of a preteenager. Each has known adversity and trials beyond his years. And each owes a debt of gratitude to unknown donors who make the Northrop Blood program possible.

Sally

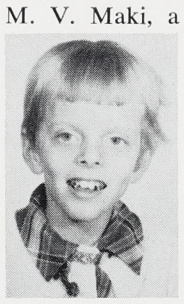
Sally Vigil is the daughter of Norair's Ed Vigil of Raw Stock Cutting.

The Vigil family had no indication of pending problems prior to a medical examination which revealed Sally had a "heart murmur."

Last November, at UCLA Medical Center, she was in open heart surgery for eight hours. It was a complete success. Fifteen days later she was back in school, playing with all her companions.

Sally required and received from the Northrop Blood program 23 pints of blood. It could have added another $575 to the Vigil family medical bills, but was available without cost.

Laura Jean Maki, daughter of M. V. Maki, a sheet metal mechanic at Norair, suffered from a rare disease known as amyotonia congenital, related to muscular dystrophy, but not the same.



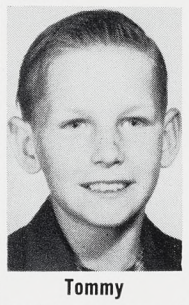
Laura Jean

Laura went through a series of three operations at Rancho Los Amigos Hospital during 1964, receiving from the Northrop program 12 pints of blood. Her surgery was for a spinal fusion to correct a curvature of the spine.

"Our daughter is now convalescing and doing fine," Mr. Maki reports. "She is looking forward to buying a poodle for which she has been saving for over a year."

The Northrop program saved the Maki family $300.

Tommy Bates is the grandson of Norair's Charles Simmons, who has received 10 pints of blood.



Tommy

Tommy lives with his grandparents and somehow managed to find a can of lighter fluid which he ignited with a match. He suffered third degree burns, critical burns over his face, neck and chest.

At Los Angeles County Hospital he was given extensive treatment which continues now in the Simmons household. However, Tommy is recovering.

In each of the three cases cited, blood was the difference between life and death. It was readily available and remains available, if more is needed. Hundreds of similar cases are on file in the Blood program office.

During April, solicitations will again be made for volunteer donors who will give blood during a May 11 bloodmobile visit.

Nortronics, Norair Progeny Pace Western Days Voting

At the mid-point of a nine-week contest, a "royal" pair of Northrop youngsters are out front in balloting for King and Queen of the Hawthorne Elks Lodge Frontier Days celebration to be held in May.

Northrop youngsters Sandra Shearer and Gary Martin await results of Frontier Days Carnival voting.

They are Sandra Shearer, daughter of Norair's Russell W. Shearer of Shipping, and Gary Martin, son of Bernice, Norair Traffic and Ray Martin, Nortronics Receiving.

The winsome duo is being sponsored by the Hawthorne Odd Fellows Lodge and are competing against 12 other teams of contestants for the big honors.

Coronation ceremonies will occur April 17 at a Coronation ball slated for Hawthorne's Memorial Auditorium. Winners will then reign during the Frontier Days carnival and rodeo in May. The rodeo, sanctioned by the Rodeo Cowboy's Association, will be held May 8 and 9.

Frontier Days festivities will be centered at Crenshaw and 120th Street on Northrop property.

Norair's Personnel Activities office is handling tickets. Those for the Rodeo sell for $1.50, $2.50 and $3.50. Each ticket sold for the rodeo, the western dance during Frontier Days or the coronation ball is another vote.

WALK THE SUPERSONIC LINE—Twenty-four members of Norair Management Club-sponsored Junior Achievement firms are shown touring T-38 and F-5 assembly line. Tour was part of annual visit that also included dinner, talks and Charter presentations. Hosts were Club advisors who have worked with youngsters since last fall.

24 J-A Members See Aircraft Assembly Line

Twenty-four members of Junior Achievement companies sponsored by the Norair Management Club enjoyed a "big day" last month when they turned out for their annual visit to Norair.

The youngsters toured the Norair factory, ate dinner, viewed special motion pictures, received their Junior Achievement Charters, and heard brief talks by F. W. "Bob" Lloyd, vice president and assistant general manager-Operations and T. L. McCarthy, manager of Administration.

Taking part were the Norair advisors who have worked with the youngsters since they organized their firms last fall. Coordinator for Junior Achievement activities for the Management Club is Rollie Pontious.

Leo Sacks, retiring Club president, was on hand to present the Charters to Mike DeDonato, president of the NORCRAFT firm, and Tom DeFloria, president of NORDESCO.

Both firms are showing excellent results for their efforts this year, Mr. Pontious reports.

NORDESCO members have manufactured and marketed a pencil holder, while NORCRAFT members have turned out and sold traffic safety blinker units.

Library of Congress Center Offers Help In Obtaining Data

An unusual "where to go" service for scientists and engineers with particular problems may be of general interest to Northrop Corporation employees.

This service is available through the National Referral Center for Science and Technology, Library of Congress, Washington, D.C.

While the Center does not process or disseminate scientific and technical data, it guides those with specific needs to appropriate resources, including technical libraries, abstracting and indexing services, data and document centers, professional societies.

Now in its third year of operation, the Center maintains extensive records on sources and also publishes a new "Directory of Information Resources in the United States."

Hawaii Tour Lures Ventura Group

A group of lucky Northrop Ventura employees and their families have fallen to the "lure of the islands" by taking part in a group tour now in progress.

The tour, sponsored jointly by Northrop Ventura and Litton Recreation Clubs, departed March 19 and will terminate March 28.

Taking part from Ventura are Mr. and Mrs. Jack Markowitz, Mrs. Marjorie Raine and daughters, Pamela and Debra, Mrs. Lois Burmahln and daughter, Carol, and Mr. and Mrs. John J. Lawrence.

John Lawrence was tour coordinator for the Northrop group.

Valley Execs Assess Scout Program

Approximately 70 executives from Centinela Valley business and industry met at Norair Division March 17 to assess progress made in the past two years with Special Interest Exploring, a new movement in the Scouting field.

Northrop was not only instrumental in getting the program started in the Hawthorne-Inglewood area, but presently sponsors two of the 10 existing posts. Norair's manager of Administration, T. L. McCarthy, is Centinela District chairman.

The program is designed to give youths in the 16-17 age group an insight into different aspects of business and industry. The posts meet twice monthly at plants of sponsoring organizations to hear lectures and participate in group projects.

Norair Division sponsors groups in industrial management and aerospace science and engineering.

Within the two major subject areas, the explorers may choose such special subjects as computer technology, taught by Bill Justice, and lasers, taught by NSL's Dr. B. J. Stallwood.

At the colloqium last week, W. E. Gasich, Norair vice president and assistant general manager-Technical, told businessmen that "it is time to see if we can double or triple" the present program.

Other organizations sponsoring posts include: City of Hawthorne (public safety), Inglewood Kiwanis (medicine, law and air transportation), Pacific Telephone (communications), Aerospace Corporation (space science), Garrett Corporation (science), North American Aviation (air industry), and Public Relations Society of America (public relations).

NORTHROP NEWS

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Big Gem, Mineral Show Promises Outdoor Fare

Northrop Recreation Gem and Mineral Club will hold its big event of the year Saturday and Sunday at the Norair Product Display building, 3901 W. Broadway, Hawthorne.

This is the group's sixth annual show and will feature the theme "Western Trails to Gemland."

Operating hours are 10 a.m. to 10 p.m. Saturday and 10 a.m. to 6 p.m. Sunday. Ample parking will be available and the entire show is free.

This annual event normally attracts some 4000 to 5000 visitors and features the crafts of approximately 150 amateur lapidary workers, plus a wide assortment of commercial items, special displays, entertainment, and films.

Lapidary equipment of all types will be on display and in operation. One special area will be set aside for the display of the very latest type of campers, camping trailers and various trail vehicles.

Invited dealers will also show modern developments in lapidary equipment.

A snack bar will be in operation and door prizes presented each hour, with added donation awards presented on the final day of the show.

"This is our biggest public show of the year and attracts some outstanding exhibits, dealers, etc.," say NRC Commissioners Dan Kozlow and Lyle Claypool. "For the family or individuals interested in the outdoors, this show is a must, since it offers such a wide range of attractions."

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Oldsmobile F-85, 1961, 4-dr. sedan, p/s, $1199. Manhattan Bch., FR 2-0307. A

Stereo turntable, Rek-O-Kut, walnut base, $50. L.A. 25, GR 4-9790. A

Bedroom Suite, cherry wood, French provincial, $450. Pacoima, 882-0761. A

Bicycle, 26″ boy's, 1-yr.-old, $18. P.V. Estates, FR 5-5097. A

Plymouth, 1964, 2-dr. h/top, 426 S eng., 4-spd. trans., r/h, $2350. Lomita, DA 6-6214. A

Ford, 1963, 9-pass. country sed., factory air, p/s, luggage rack, V-8, Cruise-O-Matic, $2150. Orange, 714-633-2984. A

T-Bird, 1959, $1000. Torrance, 329-2882. A

Alfa Romeo Spyder, 1962, r/h, 29,000 miles, $1200. Lynwood, 635-3784. A

Camera, 8mm movie, mag. load, Dejur Fadematic, turret model, 13mm f:1.9 & 36mm f:2.8, $50. L.A., GR 4-3433. A

Volvo 544, 1963, B-18 eng., new w/w tires, $1775. Hawthorne, 378-0158. A

Corvette, 1958 270-hp, stick, chrome wheels, $1500. Gardena, DA 4-3217. A

Acreage, 10, in Palmdale w/water rights, $2000. Inglewood, OR 2-7164. A

Formal, knee length, strapless, pink brocade, size 12, matching purse, shoes, size 6½, $20. Torrance, DA 6-2820. A

Occasional chair, Danish walnut, dk. blue, lt. blue stripes, $15. Torrance, FR 8-7642. A

Movie Camera, Bolex B8, dual turret, optical zoom-type finder, carrying case, many extras, $80. Torrance, DA 4-5135. A

Motorcycle, 1965 Yamaha YDS 3, 250 cc, $585. Norwalk, UN 4-7673. A

Volkswagen, 1963, r/h, low mileage, $1450. Hermosa Bch., FR 2-5985. A

Corvair Monza 900, 1961, 4-dr., r/h, $995. Inglewood, PL 5-6655. A

Washer, 1964 Norge 14 lb., used 6 mos., $135. Buena Pk., 828-2440. A

Home, 3-bdrm., family rm., 1¾-bath, 1 mile to Nortronics, covered patio, FHA terms, $19,250. Fullerton, 526-3702. A

BBQ, lge. oven w/rotisserie, thermostat, $15. Gardena, DA 7-0872. A

Lumber Rack, w/rigging levers for ¾-ton truck, $70. Torrance, 370-3023. A

End table set w/coffee table, Nevamar tops, dk. mahogany, $7.50. Torrance, 675-6637. A

Camera, Revere 8mm turret, leather carrying case, many extras, $100. Hawthorne, 675-8413. A

Refrigerator, Servel, gas, auto. ice server, 10 cu. ft., $75. Inglewood, PL 4-6079. A

Lathe, 36″ Craftsman, w/4¼″ swing, $35. Gardena, 324-3760. A

Borgward station wagon, 1958, needs paint, $195. P.V. Estates, FR 5-9740. A

Rambler American, 1961 4-dr., auto trans., heater, $650. Torrance, 328-5867. A

Runabout, 14′ Mark 20 motor, trailer, spare tire & tube, $200. Torrance, TE 1-3483. A

Shaver, Norelco elec., 110/220 v, new floating heads, $7. Torrance, 371-4741. A

Dodge Coronet, 1957, r/h, auto. trans., $300. Hawthorne, 676-3912. A

Ford Galaxie 500 XL, 4-spd., 390 cu. in., p/s, p/b, $1895. Gardena, FR 7-3636. A

Ranchero, 1964, new V-8 eng., p/s, 4-spd. trans., $1799. Malibu, 457-2979. A

Sofa, $10. Gardena, 323-1378. A

Transmission, 1963 Corvette 3-spd., w/linkage, $200. Torrance, 835-5052. A

Chord Organ, Hammond, w/percussion, walnut, instruction books, terms, $500. Inglewood, OS 5-7050. A

Bicycle, Derailluer 10-spd., boy's 26″, $25. Inglewood, PL 5-4497. A

Camera, 3¼ x 4¼ Anniversary Speed Graphic w/127mm f4.7 Ektar, film holders, $79. Orange, 714-KE 2-1232. A

Shock absorbers, 1-pr., Delco Superlift Air, 0-90 lbs. pressure, $20. Inglewood, OR 7-8868. A

Lot, 100x25′ ea., Big Bear, & hunter's cabin, trees, level, water & elec. avail., $3825. Manhattan Bch., FR 2-3878. A

Camera, Minox B, w/accessories, $150. L.A. 43, 293-3752. A

Bedroom Set, solid ash, natural finish, $100. Box 301. A

Washer, Kenmore, wringer-type, $35. Inglewood, 672-5578. A

Mobile Home, 12′x57′ Riviera, 1962, 2-bdrm., prov. furn., 35′ porch, 17′ screen rm., $6800. Long Bch., 428-1789. A

Washing Machine, Kenmore auto., 2-spd., $110. Inglewood, 677-4540. A

For Sale

Ford 6, 1954, station wagon, floor shift, new tires & clutch, $200. Hawthorne, OS 5-3880. A

Stove, O'Keefe & Merritt 40″, sep. broiler, chrome grill, $80. Gardena, 675-1005. A

Desk, maple, w/chair, $55. Torrance, 371-8564. A

TV, Zenith portable, 19″, 2-yrs.-old, $85. Hollydale, ME 3-2395. A

Swimming Pool, Trophy portable w/cover, 4′x15′, used 3 mos., $40. Manhattan Bch., FR 4-8036. A

Reducing Table, $20. Manhattan Bch., FR 2-0720. A

Mobile Home, 1964 Skyline 10′x50′ expando, furn., $1000 for equity. L.A. 47, 754-3962. A

Organ, 22-key multichord Thomas, $50. Gardena, 323-3898. A

Cemetery Lot, dble. interment, Roosevelt Cemetery, $600. L.A. 47, 756-4438. A

Chain Saw, David Bradley, 20″ lightweight, $100. Hawthorne, OS 5-2159. A

Pontiac, 1959, 4-dr. h/top, Hydromatic, p/s, r/h, $650. Bellflower, 867-5892. A

Couch, 7′ white Naugahyde w/zipper cushions, $45. Hawthorne, OS 5-7938. A

Apt. Bldg., 9-unit, 3-bdrm. owner's unit w/fireplace, $113,000. Inglewood, 671-8368. A

Acreage, 40 acres, air strip easement, good hunting & fishing, terms, $2995. San Fernando, 361-7541. A

Bedroom Set, dble. bed, $75. Hawthorne, OS 9-6982. A

Buick, 1950, $50. Torrance, DA 5-7139. A

Cadillac, 1961 sed. de Ville, 36,700 miles, $2275. Fullerton, 529-3416. A

House, 3-bdrm., den, 1500 sq. ft., 1¾ baths, no. of Manchester, $34,500. Playa del Rey, EX 1-4860. A

Lamp set, modern, 48″ high, $20. L.A. 66, EX 8-8805. A

Boat, 25′, flybridge dual controls, Chrysler Marine 6-cyl. eng., $1500. Hawthorne, OS 5-7729. A

Chevrolet station wagon, 1957, 4-dr., V-8 auto., r/h, p/s, p/b, $495. L.A. 66, 391-6045. A

Sewing Machine, Singer portable, $20. Torrance, DA 9-3721. A

Plymouth station wagon, 1959, p/s, $400. Granada Hills, EM 5-7338. A

Ford, 1959, 2-dr., r/h, new rebuilt eng., $450. Long Bch., NE 2-3489. A

Ford, 1961, Econoline, w/sleeper camper, $900. Hawthorne, 676-7185. A

Volkswagen, 1959 sed., new w/w tires, radio, seat belts, clock, $950. Torrance, 323-0180. A

Trailster, 8-hp Cushman, 2 sprockets, front & rear brakes, aux. gas tank, $200. L.A. 45, 645-0945. A

Chord Organ, Wurlitzer elec., 1-yr.-old, $700. Inglewood, 675-8914. A

Wedding Ring set, white gold, plain band, interlocks to ⅞ carat diamond engagement ring, $400. Bell, 585-9139. A

Lawnmower, power, 18″ reel-type, $30. Inglewood, 678-1446. A

House, 5-bdrm., 3½-bath, fruit trees, fenced yd., fireplace, $26,500. Pasadena, SY 4-3805. A

Chevrolet Impala, 1961, 2-dr., h/top, air cond., Powerglide, $1595. Box 302. A

TV, 27″ Zenith console, AM/FM, hi-fi, cherry wood, contemp. cab., $300. Van Nuys, ST 9-5791. A

Sofa, convertible, $50. Rolling Hills, 673-1097. A

VW 1500 S, 1964, sed., 3500 mi., $2050. P.V. Pen., FR 8-2105. A

Cemetery Plots, Inglewood, Greenlawn section, adjoining, $350 ea. Hawthorne, OS 6-8842. A

Dinette set, chrome, table w/leaf & 6 chairs, $45. Calabasas, 889-8091. A

Home, 3-bdrm., custom, lge. family rm., partly furn., Hollywood Riviera sect., $33,950. Redondo Bch., 378-1038. A

Toy Poodle, white, papers, 10-mos.-old, $85. Playa del Rey, 398-1458. A

Mercury, 1956 Monterey 2-dr. h/top, auto. trans., p/s, p/b, r/h, air cond., $325. Hawthorne, 676-5253. A

T-Bird, 1957, h/top, auto. trans., new paint, $1800. Fullerton, 714-LA 5-6776. A

Chevrolet sedan, 1956, Powerglide, $400. Long Bch., GA 3-1363. A

Bar, rattan, 4 ft. long, 3½ ft. high, 1½ ft. deep, 2 matching swivel stools, $59. Long Bch., 439-3658. A

Sewing Machine, Singer portable, $25. Playa del Rey, 398-3018. A

Chevrolet, 1957, 4-dr., good tires, $550. Hawthorne, OS 5-2000. A

Sunbeam Alpine, 1962, r/h, w/w, tonneau cover, $1325. Beverly Hills, CR 6-4879. A

Bicycle, girl's 26″, recond., new tires, $18. Gardena, DA 4-8853. A

House, 4-bdrm., 1½ bath, fireplace, schools, $1000 dwn., $17,950. Rolling Hills Est., FR 5-8778. A

Ironer, Ironrite, $95. San Pedro, TE 1-2973. A

Home, custom built 4-bdrm., 3-bath, tri-level, modern, o/sized family rm., fireplace, landscaping, $49,950. Lawndale, 370-6406. A

Wanted to Buy

File Cabinet, 4 or 5 drwr., letter or legal size metal. Los Alamitos. GE 1-4233. B

TV, 21″, Early American cab. Hawthorne, 675-8262. B

For Trade

Triumph rdstr., tonneau cover, soft top, trade for station wagon not older than 1955. Hawthorne, OS 6-5101. C

Rentals Offered

Exec. Apt., 3-bdrm., 1800 sq. ft., family rm., 3-bath, fireplace, adults, sub. parking, $300. Inglewood, 373-1143. E

Apt., 1-bdrm., unfurn. $85 mo. Torrance, DA 9-0314. E

Apt., 2-bdrm., 2 baths, fireplace, laundry serv. avail., storage space, play yd., 2 children OK, near Norair, $135 mo. Hawthorne, 679-1358. E

Room, laundry avail., $12. wk. Lawndale, 371-6775. E

Sleeping Rooms, walking distance to Plant I, $9-$10 wk. Lawndale, OS 5-5850. E

House, $115 mo. Gardena, 324-5961. E

Apt., unfurn., lge. 2-bdrm., all extras, closed gar., lge. pool & patio, near El Camino College, $125 mo. Torrance, DA 9-5986. E

Apt., 1-bdrm., 15 min. to Northrop, laundry, gar., adults, $90 mo. Redondo Bch., 379-4628. E

Share home 1 blk. from beach, 1 child OK, $25 wk. Manhattan Bch., FR 9-5044. E

Studio Apt., 2-bdrm., near Northrop, 1½-baths, children OK, $125 mo. Hawthorne, 679-7551. E

Apt., 2-bdrm., owner unit, $150 mo. Hawthorne, OS 6-7417. E

Apt., 2-bdrm., unfurn., thermo heat, carport, water & trash pd., $100. Torrance, 320-2827. E

Apt., 2-bdrm., heated pool, 1½-bath, $160 unfurn., $190 furn. Playa del Rey, 397-7656, 397-7673. E

House, 2-bdrm., redecorated, laundry rm., near Northrop, tile kitchen & bath, $105 mo. Hawthorne, OS 5-9695. E

Apt., 1-bdrm., pool, $90 mo. Redondo Bch., 376-2117. E

Apt., all elec., 2-bdrm., 2-bath, carpets, pvt. patio, closed gar., free wash & dry, $145 mo. Torrance, 370-4778. E

Apt., 3-bdrm., carport, $118. Long Beach, 422-6169. E

Bachelor Cottage, furn., util. pd., completely redec., $75 mo. Gardena, DA 4-0161. E

Apt., 1-bdrm., stove & ref., gar., adults only, no pets, near Northrop, $80 mo. Hawthorne, 676-1985. E

Rentals Wanted

House, 3-bdrm., in or near Hawthorne, by April 7, have 2 children. Hawthorne, 676-2858. F

Personals

Desire passengers to share costs of occasional light plane flights between Hawthorne & San Diego. Box 303. L

Opportunity to obtain pvt. license at min. cost as pt. owner of late model aircraft. Rolling Hills Est., FR 7-3810. L

I would like to thank all my friends at Northrop for their concern & acts of thoughtfulness during my illness & convalescence. FRED FARNER. L

For Sale or Trade

Front Axle, wheels, tires, 16 x 6.50, from 1-ton Ford pickup, $35 or trade for fencing or building mat'l. Canoga Pk., DI 8-3100. M

Falcon station wagon, 1961, 4-dr., deluxe, auto., big eng., r/h, new tires, $950 or trade for VW of equiv. value. Torrance, DA 5-7705. M

Minnie Bike, 3-hp Briggs & Stratton, $65 or trade for bd. tenor sax. Gardena, DA 4-7209. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Torrance & Hawthorne Blvds., Torrance. Lela Love, exts. 1834, 2133, 328-7234. 2

8 a.m. — 4:45 p.m.

Beverly Glen & Santa Monica Blvds., Los Angeles. J. W. Murphy, ext. 1522, GR 4-3433. 5

Blackstock & Los Angeles Sts., Simi Valley. B. I. Johnson, ext. 2844, 257-1760. 5

Orange Ave. & Del Amo, Long Beach. W. H. Covert, ext. 2721, GA 3-1363. 5

Rides Offered

8 a.m. — 4:45 p.m.

Wilshire & Crenshaw Blvd., Los Angeles. Cliff Spindel, ext. 518, 519, HO 5-8023. 15

Orange Ave. & Del Amo, Long Beach. W. H. Covert, ext. 2721, GA 3-1363. 15

Blackstock & Los Angeles Sts., Simi Valley. B. I. Johnson, ext. 2844, 257-1760. 15

PEOPLE OF YEAR

(Photo courtesy Conejo News)

Conejo Valley Chamber of Commerce held its annual dinner at Northrop Ventura cafeteria last month, with Rex Fairless (right), director of Industrial Relations at Ventura Division, presiding. Mr. Fairless, who is president of the Chamber, chats above with Marvin Burow, manager of Thousand Oaks Security Bank, Mrs. William Rothschild and Mrs. Dwight Houser, both of Thousand Oaks. Chamber gave its Woman of Year award to Mrs. Rothschild. Mrs. Houser accepted Man of Year award on behalf of her husband.

NO NEWS FROM YOU IS BAD NEWS FOR US

Response to the first two editions of Northrop NEWS' new family of publications has been both encouraging and helpful.

Because Northrop people work in scattered locations, special arrangements have been made for NEWS coverage.

For the convenience of employees, two editorial offices are maintained: at Corporate headquarters in Beverly Hills and at Hawthorne.

During the absence of Editor Charles Bradford, Chuck Ramsey is acting editor, working out of the Corporate office. He is assisted by Rosemary Hussey.

The Hawthorne office is in the Norair Industrial Relations area, second floor, with Bryan "Wick" Weickersheimer in charge. The telephone extensions are 2456 and 2457.

NEWS staff members visit each Northrop facility on a weekly, and sometimes daily, basis. Calls may be made to either office at any time to arrange appointments at outlying points.

Through the cooperation of both Public Relations and Industrial Relations, NEWS contacts have been established at all West Coast Northrop facilities. Suggestions and ideas for stories may be forwarded to any of the following:

Northrop Space Laboratories, Nils Johnson ..... ext. 2743
Nortronics (Palos Verdes), George Richards ..... ext. 441
Or Public Relations ..... ext. 236
Nortronics (Hawthorne), Harry Clark ..... ext. 301
Nortronics (Anaheim), Elmer Noonan ..... ext. 283
Northrop Ventura, Hank Still ..... ext. 343

Request for special photographic coverage should be made through either of the NEWS offices or the men listed above.

Instructions for filing classified advertisements are carried on page 5 of each edition of the NEWS. Classified forms are available through Industrial Supplies stores at each Northrop location.

Northrop Recreation Club commissioners receive special forms prior to each publication date as reminders to submit news items. Arrangements to receive such forms may be made through NEWS offices.

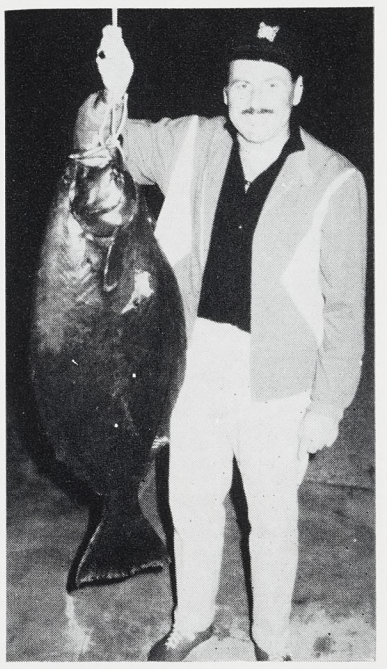
WILL MACHINES EVER REPLACE SECRETARIES?

The National Secretaries Association, Airborne Chapter, announces that a symposium entitled "The Automated Secretary" will be held in conjunction with UCLA University Extension on April 3.

The symposium, open to all secretaries, will discuss such issues as the effect of automation on the secretary's job and the promise of new leisure and cultural opportunities through automation.

Also many important glimpses into the near future will be previewed.

For information contact Marianne Weltman, ext. 1496; Marge Stevens, ext. 2358; Mayme Colombo, ext. 721.



FILETS UNLIMITED—Bob Bowditch of Ventura Division shows off 51-pound halibut.

Ambassadors Map October Travel Plans

Preliminary plans associated with group travel to Europe this fall have been revealed by the Ambassadors, an organization open to all Northrop Corporation employees.

Two grand tours are currently under consideration. Both would run from October 20 through November 27 with the traveler having an option of air travel only, or a combination of air travel and tour.

Round trip air fares would be $315 per person. Tour participation, which includes meals, European transportation and lodging, would be an additional $298 per person. A deposit of $100 is required upon date of registration. Another $100 is due on May 1, with the balance to be paid by August 1.

A Northern European vacation would include stops at such points as London, Amsterdam, Hamburg, Halden, Oslo, Stockholm, Copenhagen, Hanover, Luxembourg and Paris.

A Southern European tour would include stops at London, Brussels, Amsterdam, Koblenz, Ulm, Innsbruck, Verona, Florence, Rome, Viareggio, Milan, Lucerne and Paris.

Further information is available through all Northrop Personnel Activities offices.

NOT THE END—Three of four trustees of Northrop Ventura Employees Dollar Donor program accept plaque from United Crusade for 1964 contributions prior to announcing increased activity in promoting 1965 program. Chairman Johnnie Via, members Marjie Shaw and Dan Cashier (left to right) are 1965 trustees, along with Walker Bennett (not pictured).

Dollar Donor Trustees Plan Step-Up in 1965 Program

Trustees of the Northrop Ventura Employees Dollar Donor program this week were planning a more active approach to their charity activities, with the disclosure that only 62 percent of Ventura Division employees participated last year.

Board Chairman Johnnie Via reported at the same time that cash receipts for calendar year 1964 were $21,859. Disbursements for the year were $20,407.

Ventura Division employees were the largest single recipient of funds disbursed during the year, Mr. Via said.

"In-plant assistance for employees in dire need is by far the most important function of the program," the trustees reported.

"Since the program started in 1954, $91,000 of the $270,000 contributed by employees has been returned to needy employees."

As for outside charities, the trustees reported that about half of these funds would continue to go to Los Angeles County institutions and half to Ventura County, in direct proportion to residential areas of employees.

"Only those organizations approved by the U.S. Treasury Department receive Division funds," the report added.

While a major campaign is not anticipated this year, the trustees are preparing a program to encourage greater participation.

Dan Cashier, Ruth Payne and Walker Bennett serve with Mr. Via on the Board of Trustees.

Losing Team Fetes Winners At Outdoorsmen Banquet

Members of the Northrop Ventura Rod and Gun Club were feted recently at an Annual Awards dinner by the losing team of the 1964 Team Competition.

Scene of the event was the Golden Valley Gun Club, Pacoima, where all members enjoyed a cocktail hour and dinner, followed by the bestowing of individual honors on winners of both losing and winning teams.

Karl Stoy, past commissioner of the Rod and Gun Club, opened the proceedings and introduced John Lawrence who presented individual awards.

Trophies for total high points were presented to Earl Muehlenbach (Shooting), Beth Eaton (Salt Water Fishing), and Barbara Dukes (Fresh Water Fishing).

Special Buttons were presented to those members who had caught or bagged the largest of a species for 1964. Barbara Dukes received an award for a 155 pound marlin and a 4½ pound bass; Karl Stoy, for a 24 pound albacore; Beth Eaton, Vera Bailie and Cliff Prodger each for an 8 pound bonita; Ed Edwards for a 24 inch lake trout and Steve Kiser for a 14 inch brook trout.

Hunters of the Club were well represented by Joe Woods, who received his award for bagging a deer in excess of 150 pounds; Les Hudson for a 38 inch rattlesnake (that's right); Vince Bailie for the largest catch of migratory birds (geese, ducks), and Joe Sliakis for the largest quantity of upland game.

AN AWARD FOR EVERY ONE—This was the lineup of winners when Northrop Ventura Rod and Gun Club held its annual "Awards Dinner" at Golden Valley Gun Club. Standing, from left, are Steve Kiser, Joe Woods, Joe Sliakis, Earl Muehlenbach, Paul Lawrason, Les Hudson, Vince Bailie and Karl Stoy. Seated are Marilyn Lawrason, John Lawrence and Vera Bailie.

CAPE

(Continued from Page 1)

diameter Ringsail pilot parachute opened to operate in tandem with the drogue. Two seconds after opening, the pilot parachute pulled the rendezvous canister—containing the astronauts—from the vehicle, and the main Ringsail, with a diameter of 84 feet, was released.

For the first 10 seconds, the main chute was left in reefed condition to lessen shock. Then the reefing line was cut automatically, allowing full inflation.

The two Ventura Division items which were unused were the personnel parachutes of the two astronauts, carried for emergency escape.

H. E. Riggins, vice president and assistant general manager-Operations, and Stanley Gewant, Gemini project manager, headed the Ventura Division group at the Cape.

In addition to the eight specialists at the Cape from NSL and Nortronics, another dozen Northrop engineers were assigned to JPL facilities at Pasadena. Jack Howard of NSL is coordinator for all Northrop activities in the Ranger program.

Northrop System Tracks Echo Satellite

An airborne navigation system, originally developed by Nortronics Division (Palos Verdes) for missile guidance, has been proven successful in tracking space vehicles and satellites.

The announcement was made this week following evaluation of data received from an Air Force Systems Command satellite tracking program, conducted by Nortronics.

Using Echo I as a target, the Northrop astro-inertial navigation system far surpassed ground systems in accurately following the satellite. The program consisted of five flights over the Western Test Range.

The tracker, which locked onto Echo I by reflected sunlight, operated in a C-131 transport plane flying from Hawthorne Municipal Airport.

Stellar navigation was employed from take-off until the satellite was in range. Then the system was switched to inertial operation as the tracking mechanism began to function.

Nortronics originally developed the navigation system to guide the Skybolt missile. Principal modification was replacement of a phototube sensor with a Vidicon unit to obtain a larger field of view for more rapid acquisition.

Accuracy of the mission was supported by orbital data independently collected by Smithsonian Astrophysical Observatory.

Similar optical tracking techniques are being employed by Northrop Nortronics in the design of an airborne photographic system currently under development for the Air Force.

Designed to solve the problems associated with photography-inhibiting cloud cover, the high resolution camera system will fly at approximately 40,000 feet to film various stages of missile flight after launch.

It is expected to become operational at Cape Kennedy this summer.

Darkroom Technique Topic for Lensmen

Northrop Ventura Camera Club will meet April 5 at 6 p.m. in the Division cafeteria to hear Ross MacLean, member of the San Fernando Camera Club, discuss 35mm darkroom techniques.

The meeting is open to all employees, according to Commissioner Dan Cashier, ext. 373.

In addition to giving instructions in all phases of camera and darkroom techniques, the Camera Club loans portable darkroom equipment to its members. Or, upon special request, a darkroom will be set up in the cafeteria after 5 p.m.

Meetings are held the first Monday of each month.

John Kerr and radome.

RADOME

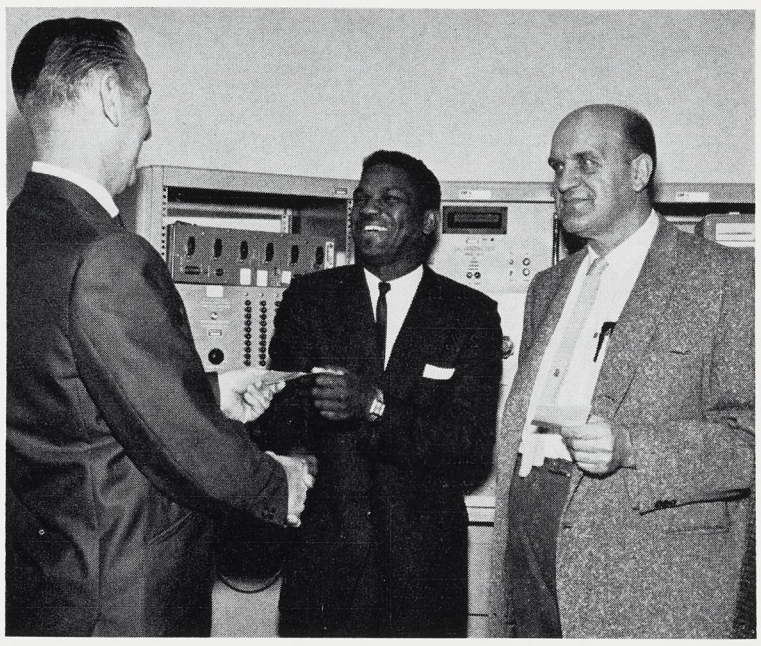
(Continued from Page 1)

necessary protection and possesses a characteristic of very low transmission loss. But since a solid ceramic radome would be far too heavy for existing missiles, the maximum use of lightweight plastics was studied by the group.

"The Ventura radome is designed for a whole family of missiles," Mr. Kerr said.

The Ventura design incorporates many different kinds of ceramic and plastic materials, and the Division now is developing its capabilities in ceramics to support its burgeoning radome business. The Division has for some time been building its capabilities in thermo-setting plastics.

Vince Gurley and Bill Lang have provided principal engineering assistance to Mr. Kerr in the development stage.



One of top suggestions to date at Northrop Ventura was rewarded recently as George Johnson (left), director of Quality Control, presented checks to Moss Stripling and Bill Davis (right). The men proposed using a new polyester resin and a different type of mold in their phase of Manufacturing. Suggestion Award Committee at Ventura Division processed 300 percent more ideas in 1964 than in the previous year, it was announced this month.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 4 | April 7, 1965

Fire Brigade Ready, Holds Full Practice

Northrop Ventura's newly-equipped Fire Brigade this month went through its first dress rehearsal with the Newbury Park station of the Ventura County Fire Department. The full-scale test of division employees' ability to cope with major disasters was the climax of more than a year of planning and training, according to Chuck Simmers, chief of Security and Plant Protection.

Plant Protection Supervisor John Steman is "fire chief" of the group, actually composed of five brigades of five carefully selected employees each. Brigade captains are John Curnow, Ray Escott, Dale Gilmore, Joe Sliakis, and Warren Sneed.

Most all members of the Plant Protection Unit also play key roles in the program.

Purpose of the brigade is to give the Northrop facility initial response prior to arrival of the County Fire Department.

"County facilities and men are of the highest caliber, Mr. Steman said, "but in the event of major disaster they would require augmentation."

Current procedure calls for the brigade to function autonomously only in the event County equipment is not available. Upon arrival of County trucks, the brigade command would immediately be turned over to the Newbury Park fire chief.

The Brigade has its own hose cart, complete with power generator and other necessary equipment to hold its own in case of disaster until regular authorities arrive.

Selected for their knowledge of plant layout and activities which occur in different sections, members of the brigade have received specialized training with close support and assistance of the County firemen, Mr. Steman said.

This month they will be awarded certificates, signed by the Ventura County Fire Chief, and white identification helmets. Training will continue, however, Mr. Steman said, with emphasis on expanding the brigade's capability to include other kinds of disasters.

DON'T POINT THAT THING AT ME—Battalion Chief Charles Sitton of Newbury Park fire station really isn't worried about Northrop Ventura's Ted Hildebrand aiming a hose, even though it may look like it. Mr. Hildebrand has had a year of training with Ventura Division fire brigade. Notice the calm on faces of Northrop's Fred Duckett (left), guard fireman, and Ray Escott, brigade captain. Brigade held its first full dress rehearsal this month.

M-C MEMBERS TAKE NEW LOOK AT SCOUTS

Members of the Northrop Ventura Management Club are taking a new look at the Boy Scout troop the Club is sponsoring.

One of the primary purposes of Scouting is to teach responsibility to young men, but recent events have prompted some Ventura Division Scout supporters to remark that they are learning a few things themselves.

As sponsor of Troop 625 in Thousand Oaks, the Management Club some time ago advanced the equipment needed to get the boys started. Little thought was given on the part of the Club to repayment.

Last month Don Archer, M-C vice president and treasurer of the Boy Scout Committee, was surprised to find in his mail a check for $10 and a delightful letter signed by the entire troop. The troop pointed out that check was "only a down payment" on the loan.

Mr. Archer probed a little further into the matter and discovered that the boys—without telling their scoutmaster—organized a garage sale.

Reports indicate the project was handled in a superbly professional manner from collecting material to promoting the event and disbursing the profits.

Mr. Archer speculated that the feeling of responsibility is heightened in the troop by its organization. It seems there are no "members."

Each of the more than 30 signatures which appeared on the letter to Ventura M-C was followed by an official title, indicating a specific responsibility, Mr. Archer said.

TENSIONS VANISH AS

Hugh Clary Belts Out a Little Song

There is more to launching a spacecraft than engineering and hardware.

And Hugh Clary is just the man to prove it.

For everyone in the launch crew knows that a little song he sings played an important part in the successful launch of Mariner IV.

As a Northrop Space Laboratories documentation engineer assigned to the Ranger and Mariner projects at Jet Propulsion Laboratory in Pasadena, Hugh wrote another chapter of aerospace legend with the song that begins:

"Good morning, good morning,

Another day is dawning. . ."

Mariner IV lifted off at Cape Kennedy November 28 atop an Atlas-Agena D vehicle. It is scheduled to pass within 5400 miles of Mars in mid-July after a 228-day cruise of 325 million miles. In addition to transmitting data on deep space environment, Mariner is expected to send back pictures of the Martian surface and information on the planet's atmosphere.

Hugh Clary's memories of Mariner, however, cover the five-month period prior to launch. As a member of the test direction team, he followed the package of intricate system from final assembly to launch.

Complete tests of Mariner took anywhere from 18 to 30 hours, Mr. Clary recalls, and on many occasions the launch team's morale at 2 a.m. was lower than the Mohole project.

It was in the wee hours of such a day that Hugh looked up from his test procedure and remembered a disc jock-

(See CLARY, Page 6)

Division Praised For 'Fine Effort' On Space Flight

Amid congratulations from NASA and McDonnell Aircraft Corporation, Northrop Ventura last week was analyzing the performance of its landing system during the Gemini flight March 23. Corporate Vice President and General Manager George F. Douglas announced this week that he had received a telegram from McDonnell — prime contractor to NASA for the Gemini capsule—which commended all Northrop Ventura personnel "for their fine effort directed to the Gemini Project."

"The cooperation, understanding and thoroughness displayed by Northrop Ventura personnel throughout the entire program has most certainly been appreciated by the McDonnell/Gemini team," the McDonnell statement said.

A transcript of comments after the flight by astronauts Virgil Grissom and John Young included these comments:

"As we came on down to 10,000 feet the main parachute came on out normally as we expected," Grissom said. "It came out in a reefed position and deployed in its full open position.

"There were no holes in it, no tears in it, it was a perfectly beautiful chute. A really beautiful thing."

"Sure was," Young agreed.

Program Manager Stan Gewant returned to his Ventura office to report numerous "unofficial" congratulations from NASA and McDonnell personnel assigned to Gemini, as well as representatives of Weber Aircraft Corporation, which awarded Northrop a contract for the Gemini ejection seat system."

Mr. Gewant was in turn full of praise for the Northrop staff, which included: former project engineer Bert Engstrom; project engineers Bob Provart and Russell Torgerson; and John Swanson, Floyd Payne, Lou Vinson, Don Petit, Milt Dobrich, Bill Degnan, Gene DePoe, Lou DuMond, and Larry Richardson.

Clyde Rockey and Robert Parnett were contract administrators.

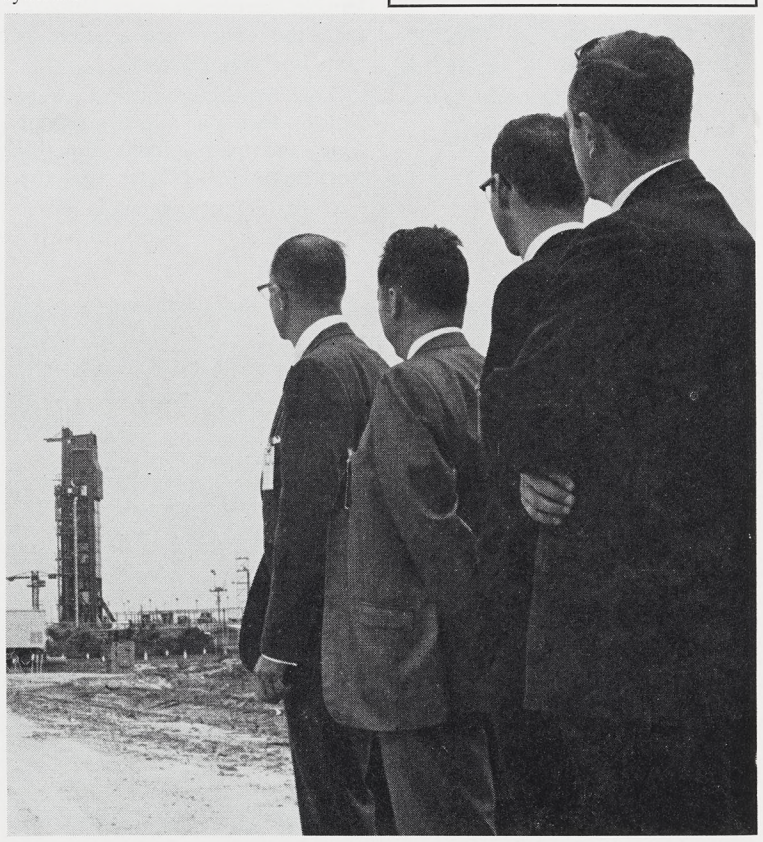
NORTRONICS MAN CLAIMS RECORD FOR COMMUTERS

Unless someone can top him now, Leo Grizel would like to claim an all-time commuter record of 196,000 miles.

Mr. Grizel of Nortronics (Palos Verdes) has driven the miles going to and from work at Northrop.

Between 1946 and mid-January of this year, Mr. Grizel lived in Burbank and commuted to Hawthorne. Earlier this year he transferred to the Division's Palos Verdes facility, adding about 30 miles to his daily round trip.

Mr. Grizel logged most of the miles in a 1947 model used car he bought in 1956, although he's used five other cars during the period.



WISTFUL WAIT—Northrop Ventura representatives at Cape Kennedy eye launch pad for Titan II/Gemini vehicle just prior to historic flight. From left is H. E. Riggins, Stan Gewant, Larry Richardson, and Hank Still. See page 4 for their eye-witness account.

M-2 Research Glider Out of Assembly Jig

LIFTING BODY VEHICLE SET FOR JUNE DELIVERY

Northrop Norair has removed the M-2 lifting body research glider from its assembly jig. Delivery is slated for early June. Immediately after removal of the M-2, modifications to the jig were started for fabrication of the HL-10. Norair is building both vehicles for NASA.

With the exception of the lightweight plywood model which was flown successfully at NASA Flight Research Center, they are among the nation's first manned lifting body vehicles and will be used in an extensive test program to further the art of returning manned vehicles from space.

Present schedules call for the M-2 to go to Ames Research Center for a 100-hour wind tunnel test program. Subsequent flight testing will be performed at Edwards AFB.

Most systems utilized are "off-the-shelf" type items already in use on aircraft. For instance, the main landing gear is from the Northrop F-5A with main wheels and brakes from the Northrop T-38.

Design provisions have been made for ultimate installation of rocket engines.

The vehicle will be carried aloft under the wing of a B-52 mothership, as with the X-15 research vehicle. In fact, the X-15 pylon is used for either vehicle by equipping it with a Northrop-designed adapter.

Norair is designing and building the M-2 and the HL-10 vehicles under a $1.8 million contract with NASA.

NASA's Ames, Langley and Flight Research Centers are cooperating in the project for the NASA Office of Advanced Research and Technology.

Paul Bikle is director of the Flight RC; John G. McTigue serves as M-2/HL-10 program manager for NASA.

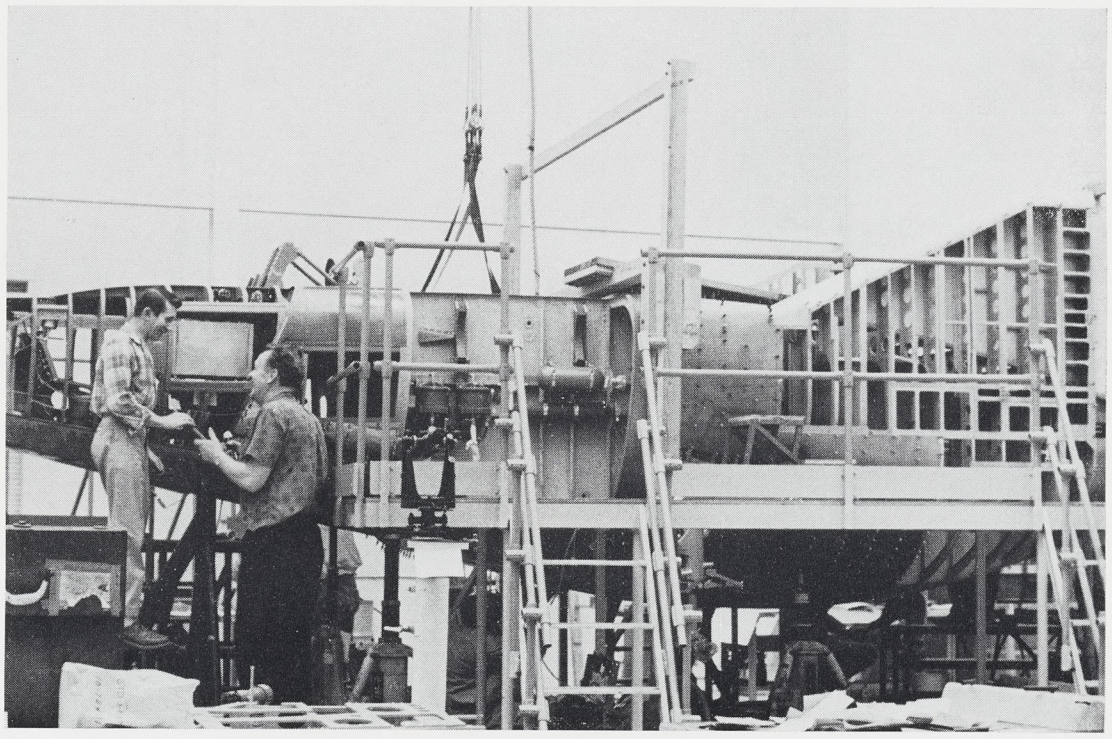
Heading Norair administration of the effort are Dr. L. R. Fowell, manager; Ralph C. Hakes, director, and Chiefs L. W. Klauer (Engineering) and Rex Thornhill (Construction).

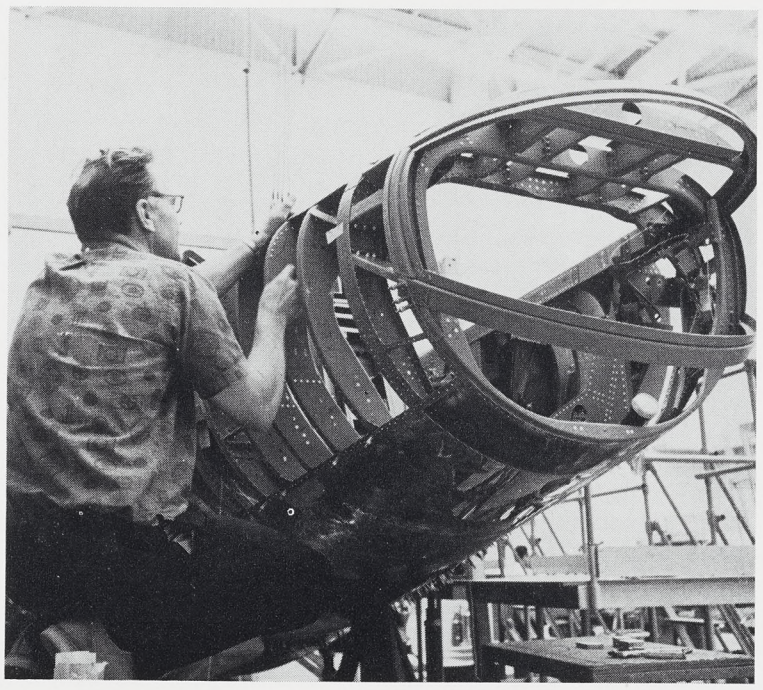
Other key Norair project figures are: T. J. White, Quality Control; C. H. Hiller, Fabrication and Assembly; Clifford Peterson, Materiel; J. E. Wolfe, Structural Design; F. R. Erb, Systems and Mechanical Design; R. C. Pontious, Test Operations; and Ray Horton, Tooling.

Filling out the project staff are about 125 high-quality engineers and factory employees with extensive aerospace experience. In fact, the experience average per man is about 20 years.

This combined project organization, through outstanding personal and team efforts, is making it possible for Norair to adhere

(See GLIDER, Page 3)





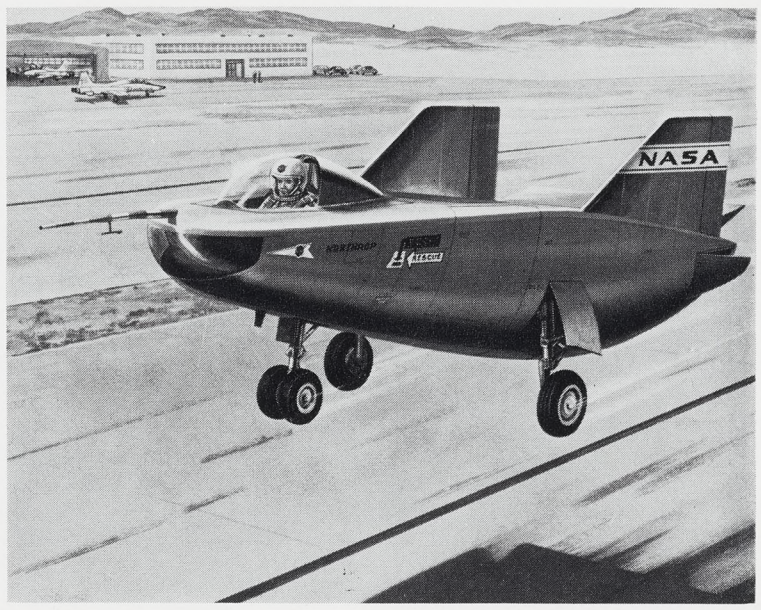
SHAPING UP

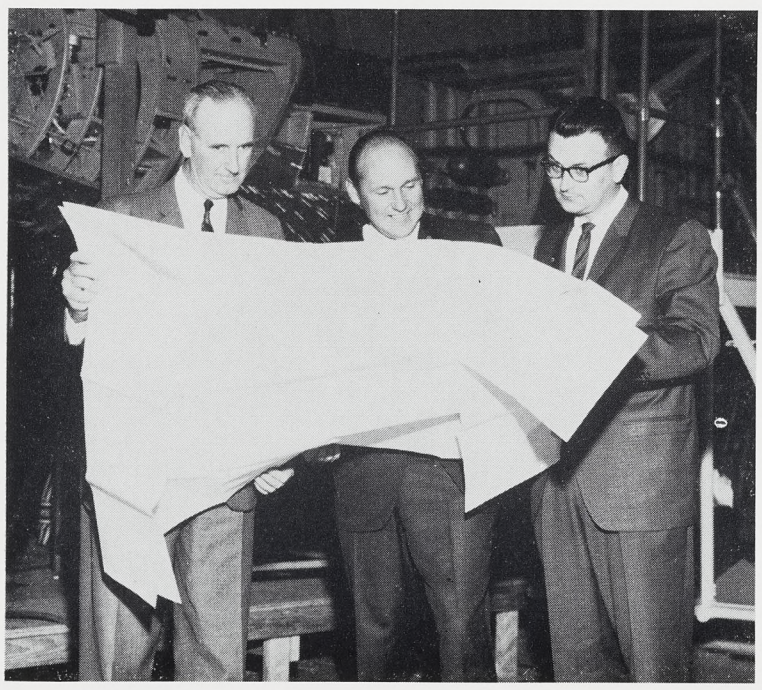
Four views of M-2 mark progress and hopes for complete success. Jack Fisher and Marvin Elkin (above) liven up full length shot; Mr. Elkin (left) works on front end; artists conception (below) shows M-2 gliding to landing; rear of vehicle (bottom of page) is being designed for possible inclusion of engine.

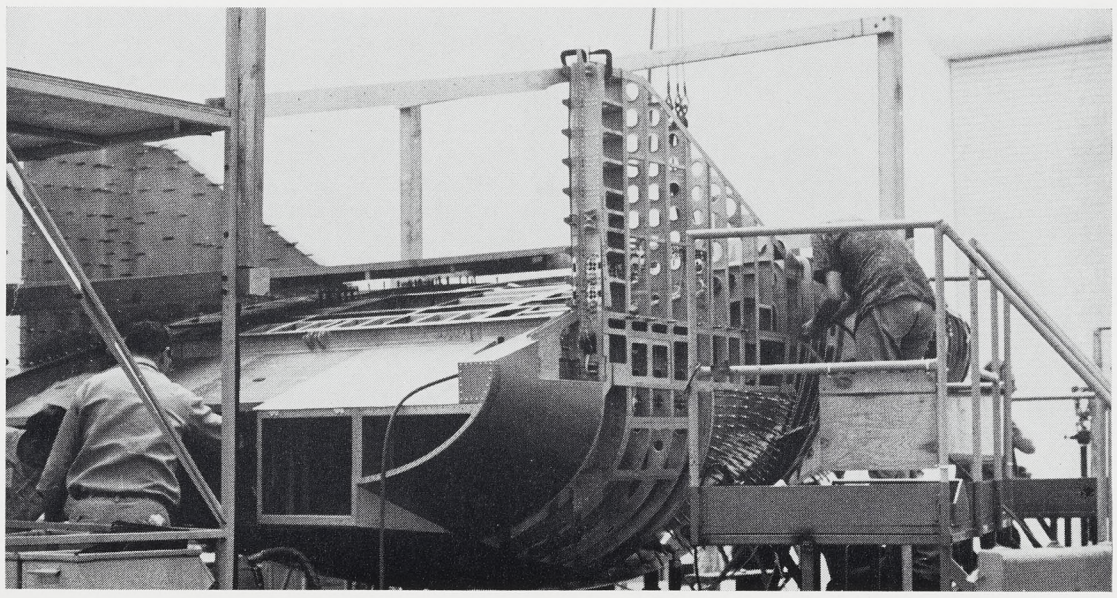
TOOLS OF TRADE

Robert D. Martinas (above) prepares fasteners for M-2 fabricators, while designers (below) check drawings. Ralph C. Hakes, Norair project director; John G. McTigue, NASA program manager; and L. R. Fowell, manager of Program department (left to right) this month praised smooth operation of project to date.

Photos by BILL COX and DAVE SALDANA







SMITH, RICHARDSON SELECTED FOR NEW IR ASSIGNMENTS

Appointment of Frank R. Smith to fill a new position as Northrop Corporate director of Industrial Relations has been announced by William Larrabee, Corporate vice president—Industrial Relations.

Mr. Smith moves to his new assignment from Northrop Space Laboratories where he has served as director of Industrial Relations and is being succeeded by John J. Richardson, formerly of Nortronics Division.

Holder of a law degree from the Loyola University School of Law (1955), Mr. Smith received a B.A. degree in Business Administration (1947) from UCLA and graduated (in 1944) from the University of Michigan Japanese Language School.

Mr. Smith joined Northrop at Norair Division in 1956 as chief of Employee Relations and worked previously at Douglas Santa Monica as staff assistant to the director of Industrial Relations.

Mr. Richardson's Northrop experience dates back to 1951 and includes work as Employment supervisor, general supervisor of Personnel Administration and chief of Industrial Relations at Nortronics' Systems Support department. He has been chief of Personnel Administration for Nortronics for the past year.

Mr. Richardson studied Industrial Relations and Industrial Management at the University of Southern California prior to joining Northrop.

Mr. Richardson

Mr. Smith

PALMDALE FAMILY AFFAIR — Father-son teams currently working at Norair (Palmdale) have logged over 100 years of combined Northrop service. Three of sons were born after their father began Northrop service. Men, from left with father's name first, are William C. and Dennis Wible, George M. and Charles D. King, Herman J. and Fred J. Burns, David G. and David G. (III) Hogarth, and Ray A. and Donald E. Bevans.

(Norair Division photo)

NORTHROP LOOKS AHEAD

Anticipating Events to Come

What are the probable consequences of the population growth in the United States? In other countries?

Which of the new nations of Africa are really going to make any industrial progress in the next decade?

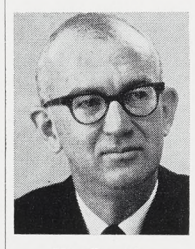
What is the state of Mao Tse-Tung's health . . . and who is likely to be his successor?

In ten years, it is said, computers will be able to store all the information in the Library of Congress and deliver any data in 10 seconds. How will this kind of capability affect the business environment?

Questions such as these are of vital concern to Ward B. Dennis, Corporate vice president - Forward Planning. Mr. Dennis' job is to see these events and to understand the opportunities . . . and dangers . . . they may hold for Northrop.

A good example is the recent explosion of a nuclear bomb by Red China. "With this development," says Mr. Dennis, "the Chinese have taken a major step toward the possibility for waging a sophisticated war. What course will they pursue and what will be the future impact on United States defense posture?

Because of Northrop's diversity, there's no narrow boundary on its future business prospects. As a result, Mr. Dennis must keep his fingers on many a pulse. "The purpose," says Mr. Dennis, "is to plan in anticipation of events to come, not to react to events that have already occurred."



Mr. Dennis

Mr. Dennis keeps a watchful eye on opportunities in such things as the Great Society, rapid population growth, the shifting policy of the Soviet government, the impact of the supersonic transport of our economy, and the country's future needs in transportation and in development of water resources.

Marketing organizations in Northrop are continually investigating the opportunities for Northrop that Government planning may hold. But Forward Planning is looking for the important consequences of new developments in the technical, political, economic, social and military areas which could affect the future course of company business.

(See DENNIS, Page 5)

Papers Call Sounded By Shock Symposium

A call for papers for the 35th Shock and Vibration Symposium to be held October 26-28 at New Orleans, Louisiana, has been issued.

The program will be devoted to technical presentations and discussions which tend to advance the shock and vibration technology. NASA will be the host.

Summary information on potential papers must be submitted by July 13, with final papers due October 11. Information should be forwarded to: Shock and Vibration Center, Code 4021, U.S. Naval Research Laboratory, Washington, D.C. 20390.

Steven Kyser Wins Top Essay Laurels

Steven Kyser, a member of Norair-sponsored Explorer Scout Post 173, has earned the right to enter a national contest on the strength of his recent accomplishments.

Steven, a Morningside High School senior, took first place in a local contest for his essay on "How the Handicapped are Overcoming Barriers to Employment in My Community." He will deliver the same essay in a national contest at Washington, D.C.

Presentation of honors was during the Centinela Valley "Ability Counts" Awards luncheon held March 12 at the Airport Marina Hotel.

Sponsoring the event were the President's Committee, the Governor's Committee and the Centinela Valley Committee on Employment of the Handicapped.

John B. Clark, retired Norair director of Industrial Relations, presented the awards. Roland B. Scott, executive assistant to Paul Crews, Norair's director of Industrial Relations, is currently a member of both the Governor's and Centinela Valley Committees.

Glider: Unique Organization Cuts Cost, Speeds Activity

(Continued from Page 2)

to the tightest possible funding on the project.

Toward this end, Norair has made some special arrangements.

The project organization is segregated from other Norair operations to minimize interference and factory areas are co-located with engineering for ease of communication.

Engineering releases and most paperwork have been chopped to the barest minimum. Incoming materials and stocks are located adjacent to the assembly jig. Engineering liaison is accomplished by the design engineers.

Experienced experimental shop technicians are fabricating and assembling components from a bare minimum of formal drawings, and in some cases, from verbal instructions. Few detailed drawings have been made. A special photographic process has been perfected to transpose drawings onto actual raw stock, avoiding costly jigs and fixtures.

A paramount factor has been cooperation, within Norair functions and especially between Norair and the NASA organizations involved.

"In my 37 years of experience I have never encountered such close harmony on a project," Mr. Hakes said. "We are deeply indebted to NASA for its valuable and timely help every step of the way."

Mr. McTigue added a word of praise for the very special efforts of Norair individuals and the entire project organization for its team showings.

"We have encountered problems, met them head on and worked out solutions jointly," Mr. McTigue added. "This program will go down as an excellent example of what close cooperation between many organizations can accomplish."

Sea World Visit Set for April 24

The combined NRC Travel Club, open to all Northrop employees, has slated a special one-day trip to visit San Diego's new Sea World.

The date is April 24. One Greyhound bus (capacity: 29 passengers) will depart the NRC Clubhouse at Hawthorne at 11:30 a.m. going direct to Sea World. At 5 p.m. arrangements will be made for dinner at the Vacation Village.

Round trip bus fare is $5.50 per person. Admission (to Northrop folk) at Sea World is $1.75. Steak dinners will be an additional $3.95 per person.

Tickets are now available through Personnel Activities offices at each Northrop facility.

MORRIS PLOTKIN NAMED CORPORATE PLANS DIRECTOR

Morris Plotkin has been named Northrop Corporate director—Industrial Planning, reporting to Robert R. Miller, senior vice president—Corporate Relations.

Mr. Plotkin

Under Mr. Miller's guidance, Mr. Plotkin will have responsibility for the planning, coordination and direction of investigations relating to diversification possibilities for Northrop through potential acquisition of other companies or segments of companies, formation of joint ventures, and the acquisition of new products or technologies.

Mr. Plotkin joined Northrop in 1956 as assistant director of Facilities Planning and has been on the Corporate Development Planning staff since May 1957. Prior to 1956 he was with Slick Airways, Inc. and Civil Aeronautics Administration in executive capacities.

Mr. Plotkin holds B.A. and M.A. degrees from UCLA in Political Science.

NORAIR COLLECTION ESTABLISHED TO AID EYES FOR THE NEEDY

Northrop Norair employees and friends are being asked to lend a special hand to New Eyes for the Needy, Inc.

This nonprofit, charitable organization makes eyeglasses available to needy persons unable to procure them otherwise. Since 1932 it has served this purpose and has never solicited funds.

Sought are metal frames in any condition, unbroken plastic frames, sunglasses, artificial eyes, cataract lenses, and soft glass cases.

Also useable are broken costume jewelry pieces, earrings without mates, damaged silver or other precious metals. These are refined and money obtained used to provide funds to hospitals across the nation to buy glasses.

Collection boxes have been set up in Norair's Personnel Activities office.

NORTHROP NEWS

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NRC, ICE CAPADES MARK SILVER ANNIVERSARIES

An all-Northrop "Night at the Ice Capades" has been set for May 5 at the Los Angeles Sports Arena.

Because both the Ice Capades and Northrop Recreation Club are observing "Silver Anniversaries" this year, very special arrangements have been made.

Choice loge seats, 1000 of them, have been reserved for Northrop folk and are now on sale at west coast facilities at a bargain rate ($2.50 for regular $3.50 seats). And this is the opening night of Ice Capades 12-day run in Los Angeles.

While they last, tickets may be obtained from all Personnel Activities offices throughout Northrop; from Kay Cribbs at the Corporate office; Kelly Burke at Edwards AFB; Tom Post at Palmdale; Polly Middleton at Mariposa Warehouse; and the Personnel office at both Northrop Space Laboratories and Northrop Architectural Systems. Ventura Division tickets are available at the cafeteria.

Men, Moon, and a Morning Ride Through Space

GEWANT MIRRORS GEMINI PROGRESS

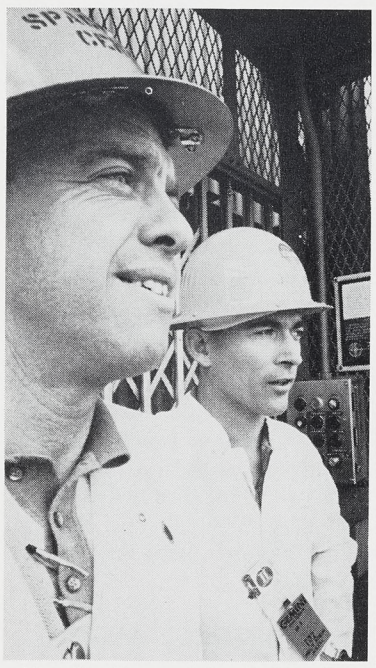
Progress of the Gemini orbital flight is mirrored in the expressions of Stan Gewant, program manager for the Northrop Ventura landing system.

What? A leak?

Re-entry in 10 seconds

They've got a drogue!

They're on the carrier!



Alan B. Shepard Jr. (left), pilot of Mercury Redstone 3 in 1961, has last minute words for John W. Young before launch of Gemini 3. Northrop Ventura landing systems returned Mercury spacecrafts to earth as well as Gemini 3.

Molly Brown Parachute "Beautiful"

A Northrop News Special

"Perfectly beautiful!"

These two words summed up the feelings of Astronauts Virgil I. (Gus) Grissom and John W. Young when their 84-foot orange and white main landing parachute blossomed above the Molly Brown on March 23.

Although the landing of Gemini Three was out of sight—far to the east in the Atlantic Ocean—the parachute was equally beautiful to Northrop Ventura personnel who waited tensely at Cape Kennedy, Florida and scores of others who helped fabricate the system at Newbury Park, California.

There was no doubt in the minds of technicians and engineers that the landing system would do its job. It had been tested scores of times under exacting conditions. But there was still a mental sigh of relief when word came that America's first two-man astronaut team had landed safely.

The flight of the Molly Brown itself was a culmination and a beginning. It brought to successful conclusion years of work which involved more than 1000 U.S. industries and 400,000 people under the direction of the National Aeronautics and Space Administration. It began a series of flights which will test men in long term weightless orbital flight and train them in rendezvous techniques essential to Apollo lunar flights late in this decade.

Tuesday, day of the flight, dawned clear and warm with a soft tropic breeze blowing in from the ocean. To the north of Cocoa Beach, a white glow in the sky marked the ring of searchlights around the base of the huge Titan II rocket booster where technicians made final preparations to load Grissom and Young aboard their spacecraft.

A chosen "pool" of newsmen and photographers were taken to the launch pad to witness and report on the astronauts as they ate breakfast, suited up and then were driven from their cloistered apartment on the base to the Gemini Titan launch Pad 19. As they were strapped into their seats aboard the spacecraft, both Grissom and Young appeared as unruffled as if they were going for a morning hop in a T-38 trainer.

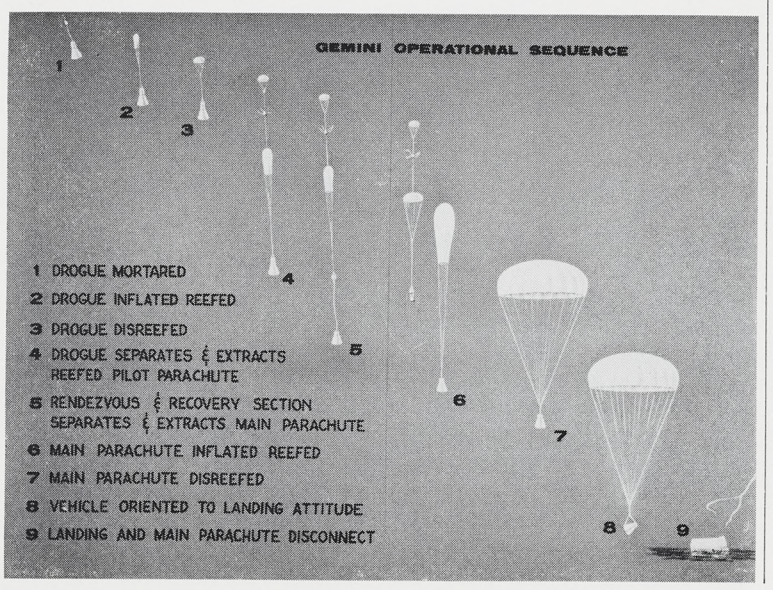
An hour before launch time, the count was ahead of schedule, but then, about T-minus-40 minutes, a leak was discovered in a hydraulic line aboard the Titan booster. In earlier days, when spaceflight was a more experimental infant, this could have caused a mission "scrub" and a delay of two or more days in the flight. But this time a technician crawled into the booster, tightened a nut with a wrench, and the count was resumed.

At T-35 minutes, the huge gantry of steel girders topped by a white room laboratory, was lowered away. The white and black Titan booster towered clear above the scrub brush and palmetto of the flat Cape land, the Gemini spacecraft appearing as a small cone on its tip.

Without a flaw, the countdown continued until 9:24 a.m., T-minus-zero, a cloud of orange red smoke boiled from the base of the giant rocket. Moments later, it lifted majestically from the pad,

(See GEMINI, Page 5)

Northrop engineers assigned to Ranger IX program crowd around podium at Von Karman auditorium (above) to get official results of photographic mission. Control room at Cape Kennedy during Gemini flight (below) waits word from spacecraft that landing system is functioning normally.



Moon Drama Cheered by A.M. Viewers

A Northrop News Special

It was reminiscent of a Saturday afternoon at the movies 20 years ago, when a youthful audience inhaled and exhaled according to the perils and successes of Hopalong Cassidy or The Cisco Kid.

There were gasps; there were cheers; there was applause; there were moments of silence when everyone leaned forward as if expecting a badman to leap from behind a rock.

The audience ranged in age from teenagers to septogenarians, both men and women. But they all became children of the universe as a drama unfolded on a battery of screens in the semi-darkened room.

They were among the first people on earth to see live television pictures from space. They were moving 5977 miles per hour toward the moon in the Ranger IX. They were struggling to gain perspective as three huge craters disappeared into one; as a boney ridge in the crater Alphonsus suddenly dominated the screen.

As more craters appeared below the ridge it looked as if Ranger IX had suddenly reversed itself and climbed back to an altitude of 1500 miles, but actually the audience was seeing tiny craters on the floor of Alphonsus.

When Ranger IX impacted at 6:08 a.m. March 24, the group of Jet Propulsion Laboratory employees, the press, and select visitors rocked the assembly room at JPL's Von Karman auditorium with their applause.

NSL's Bob Winneberger, who had full responsibility for trajectory design on the last three Rangers, jumped up with a big grin on his face (despite the lack of sleep for the past three days) and sought out other Northrop employees in the room.

He found Chuck Lombardo, who had just returned the night before from Cape Kennedy, and congratulated him on the excellent pictures returned by Ranger. Chuck was cognizant engineer for the TV payload and followed the system from inception at Pasadena to launch at the Cape.

(See RANGER, Page 5)

Cheering crowd relaxes after 19 tense minutes of watching moon through eyes of Ranger IX.

GEMINI: Never a Longer Wait for Contractors

(Continued from Page 4)

slowly at first, trailing a dancing, transparent rosy glow of flame.

For many, the waiting was over. The people who built the booster could go home now (although none did) because the booster had done its job. But nearly five hours of sweat remained, the time to complete three orbits, for those responsible for the welfare of the astronauts —all the way home.

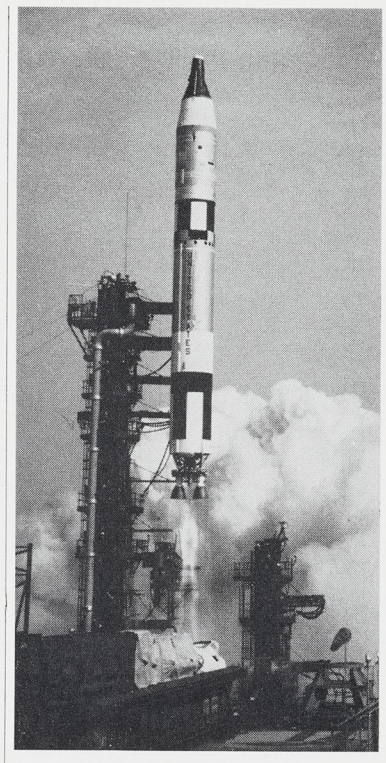
At the press site from Northrop Ventura were H. E. Riggins, vice president of Administration; Stan Gewant, Gemini project manager and Bert Engstrom, Gemini project engineer who had seen the landing system move from its inception to its acid test in manned flight.

Hours passed slowly in the hot sun with only occasional reports to indicate progress of the astronauts. At one point there was a rumor that trouble aboard the Gemini spacecraft would terminate the flight at one orbit, but this trouble passed and the flight continued.

Finally the third orbit neared its end. The retro-rockets fired, and the communications blackout began, the critical period during which the sheath of hot re-entry gases around the spacecraft cut off radio voice contact.

Seconds passed. It was time now for Grissom to release the switch which would deploy his 8.3-foot drogue stabilization parachute at 50,000 feet.

"They have a drogue", the



Titan II does its share.

voice of NASA's Paul Haney in Gemini Control announced calmly. "Molly Brown notifies that the drogue is out."

The sigh of relief was a real one then. That announcement meant that the astronauts were capable of operating the system, and that it worked. There were no more announcements until word came that a plane had spotted the Molly Brown, floating on the ocean nearly 60 miles from the recovery carrier.

Grissom and Young were home.

DENNIS: Looking Ahead

(Continued from Page 3)

"Forward Planning's role is to understand the impact of such events as a guide for investigating potential opportunities in detail," explains Mr. Dennis.

Forward Planning begins with some very fundamental thinking about what kind of company Northrop is, and where it wants to go. This is not a one-shot decision, but rather a continuing analysis. Out of the analysis comes recommendations to the company's president, who sets long-term objectives and specific goals.

These objectives are not put under lock and key for a ten-year period. A long-term objective, points out Mr. Dennis, "is used to guide our current decisions and actions, and is continuously reviewed and tested for soundness in view of our changing environment."

Forward Planning seeks to define levels of activity in various business areas and the long-term investment and return to be realized from these areas. In essence, he frames an answer to the question: How much can we do and when?

Once the company's long-term objectives and specific goals have been set by the company's president, detailed plans are prepared for reaching these goals.

RANGER: Dawn Brings Success

(Continued from Page 4)

"The camera system was basically the same on Ranger IX," he said, "but the performance was much better."

Jack Howard, coordinator of all Northrop participation in the program, and John Schindler, program engineer, were chatting by a mockup of the Ranger IX, when JPL Program Engineer Ross Fink came up to shake hands.

Still at the Cape were Ed Travers, Mike Carolin, Mike Kelley, Herman Ayers, John Iwatsuru. Among those Nortronics and NSL men who decided to watch the show from their homes were Phil Billington, Tom Laney, Ken Lapardy, Joe Miller, Bob Kennedy, Keith Emberson, Art Cohee, and Frank Baran.

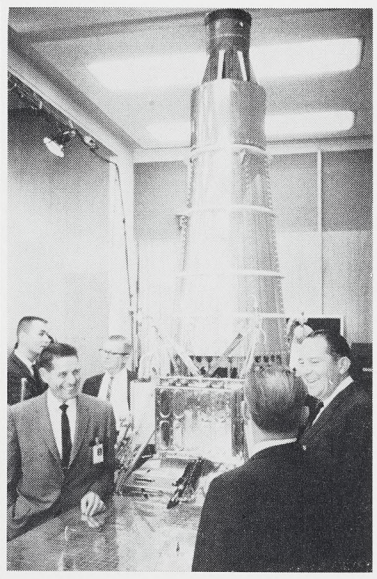
Key Nortronics men for systems used by Ranger had long since taken other assignments. Gordon Click was project engineer at Palos Verdes, assisted by Fred Corey and Don Domike. Lead engineers were Don Bull (electronic modules), Bob Kernor (celestial sensors), Laird McIntosh (inertial sensors), and Wilf Cowell (gas systems).

A small group of Northrop engineers will remain at JPL through the flight analysis stage.

JPL is now looking ahead to the first surveyor flight, which involves a soft landing on the lunar surface, it was announced at a press conference following the Ranger impact.

After the excitement was over in Von Karman auditorium, the Northrop team walked out into the new dawn just as JPL employees were rushing to their jobs.

NSL's Alan Kidd, who worked on the JPL program director's staff, came up with the capper to the three days when he said: "It's time to go to work."



JPL Program Engineer Ross Fink (left) chats with Northrop's John Schindler (far right) and Jack Howard beside mockup of Ranger 9 in Von Karman auditorium.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Refrigerator, Coldspot, $75. Hawthorne, OS 5-1057. A

Desert-Aire lamp, new coil, $35. Pacoima, 882-0761. A

Movie Camera, Holiday 8mm. turret, & projector & screen, $85. Inglewood, OS 5-7050.

Stove, apt.-size, $45. Inglewood, 677-4540.

Refrigerator, Servel, gas, 8 cu. ft. w/top freezer, $20. Gardena, 675-1005. A

Volvo, 1963, model 544, low mileage, all extras, $1775. Hawthorne, OS 5-1708. A

Power Mower, reel-type, $20. Lomita, DA 6-6214. A

Valiant V200, station wagon, 1961, auto. trans., p/s, r/h, new tires & brakes, $895. Inglewood, PL 5-4497. A

Corvair Monza Cpe., 1961, 3-spd. stick, r/h, w/w, $850. Thousand Oaks, 498-2867. A

Enlarger, solar photo, 35mm to 4″ x 5″ w/ lens, $30. Gardena, DA 9-2904. A

Freezer, Duncan Hinds chest-type, 18 cu. ft., $200. Redondo Bch., FR 4-7985. A

Boat, 14′, trailer, new 25-hp Elgin eng., gas tank, cables & steering, $365. Hawthorne, OS 6-4923. A

Mobile Home, Roadcraft, 8 x 35′ cabana, louvered windows, steel storage 8x8′ rm., $4500. Gardena, 329-5879. A

Bedroom Set, 7-pc., solid walnut, mattress & spring, $150. Inglewood, OR 1-3860. A

Pontiac Tempest, 1964, 16,300 miles, 2-dr. sed., $2100. San Pedro, TE 3-9430. A

VW sedan, 1961, $900. Hawthorne, OS 6-1048.

House, 3-bdrm., 2-bath, heated pool, near Peninsula center, $38,500 or $300 mo. 1 yr. lease. P.V. Pen., 377-5936. A

House, 4-bdrm., stucco, plus 7 5-yr-old units, furn., near Northrop, 10% dn., $75,000. San Pedro, TE 3-2512. A

T-Bird, 1955, $1050. Hawthorne, 675-4555. A

Recliner Couch, chair, dryer, Hot Point elec., $200. San Pedro, TE 1-4906. A

Custom Drape sets, fully lined, silver grey, nubby loose weave, 11½ & 16 ft. long, $115. Thousand Oaks, 495-5949. A

Bicycle, 1965, girl's 26″ Spaceliner, $49. Van Nuys, ST 4-2332. A

Swim Pool, 18′ x 42′, hy-duty vinyl impreg. nylon, skimmer, ladder, filter, $100. P.V. Pen., 377-4905. A

Golf Bag, green plaid, $3.50. Downey, 923-8532. A

Volkswagen station wagon, 1961, 10,000 miles, 1 owner, $1125. Redondo Bch., 376-6153. A

Hondo Dream 305, 1963, fully equipped, $450. Los Alamitos, 596-4215. A

For Sale

Sprite, 1959, customized, new tires, $700. Hawthorne, 631-6885. A

Dinette Set, Danish modern, white formica top, 6 chairs, $70. Walnut. 714-535-4959. A

Record player, Garrard model RC-90, 3-spd., hi-fi, w/magnetic cartridge, $25. L.A. 45, 645-4887. A

Model Airplanes w/McCoy engines, all hand controls, batteries, $25. Playa del Rey, EX 1-4860. A

Buick, 1957, fully powered, $295. L.A., 756-0068. A

House, 4-bdrm., family rm., 2-bath, ⅓ acre, pool, 3-yrs.-old, low dn., $37,900. Northridge, EM 3-1679. A

Falcon Ranchero, 1963, standard, r/h, w/w tires, $1200. Long Bch., 425-9532. A

Honda Trail 90, 1965, under 600 miles, $300. Gardena, DA 9-9046. A

Accordion, 120-bass, w/3 switches, case, $100. Manhattan Bch., 379-5366. A

Headboards, pr., twin, aqua leatherette covered, $10. Redondo Bch., FR 5-0061. A

Typewriter, L. C. Smith, elite, 15½″ carriage, $25. Downey, TO 2-9547. A

Quartz Lamp, floor model, approx. 11″ dia. w/timer & adj. stand, $50. Brea, JA 9-2369.

Studebaker Pickup, 1956, deluxe cab, 228 V-8 eng., column shift, o/drive, new tires, r/h, $425. Hawthorne, OS 5-1787. A

Corvair Deluxe, 1960, auto. trans., low mileage, $795. Hawthorne, OS 9-8620. A

Refrigerator, Frigidaire, 13 cu. ft., l-h door, $60. Gardena, DA 9-4451. A

MG-TF 1500, 1955, wire wheels, new top, $675. Manhattan Bch., FR 2-0540. A

Piano, upright, recently tuned, $100. Rolling Hills, FR 7-1687. A

House, 2-bdrm., 65′x160′ lot, 3-yrs.-old, completely furn., close to Lake Elsinore & Lake Matthews, $11,000. Gardena, DA 4-1593. A

Freezer, 21 cu. ft. chest, Coldspot, $135. Redondo, FR 8-2609. A

Sewing Machine, Montgomery Wards console, $25. Redondo, FR 4-2440. A

Tohatsu 50cc, 1963, 55-mph, $140. P.V. Est., FR 5-8801. A

Speaker cabinet set, ¾″ mahogany ply, 12″ co-ax speakers, labrinth sys., $30. Paramount, ME 3-0619. A

Olds Cutlass, 1964, V-8, auto. trans., p/s, p/b, r/h, w/w, $2550. Box 401. A

Studebaker Lark, 1959, stick shift, new motor, brakes, clutch & tires, good mileage, $525. Torrance, DA 9-9407. A

Camper, Pullman, all steel, fits fleetside pickup, dble. rollout top, full-size windows, $325. Gardena, DA 4-7623. A

Rambler American, super 2-dr., $150. Ventura Div., 498-3131, ext. 420. A

Kitchenette Set, maple, $35. Gardena, DA 9-7447. A

VW Camper, 1962 w/stove & ice box, $1200. Hawthorne, 675-9068. A

Range, O'Keefe & Merritt, gas, fully automatic, $150. Inglewood, OR 8-0636. A

Sax, Buescher Tenor, $125. Manhattan Bch., FR 4-6003. A

Range, Tappan, center grill, 4-yrs.-old, $25. Inglewood, OS 6-1475. A

Sewing Machine, White rotary, w/cabinet, $20. L.A. 36, 933-4551. A

Enlarger, 4x5 Federal, print dryer, 3 hard rubber trays, speed easels, many extras, $80. Compton, 635-3294. A

Car cover, VW or Porsche, custom, green, water resistant w/tiedowns, used twice, $15. Box 402. A

Cemetery Plots, Inglewood, Greenlawn section, adjoining, $700. Hawthorne, OS 6-8842.

Volkswagen 1500S sedan, 1964, FM radio & many other extras, $2325 or $2190 w/out radio. Torrance, 322-2152. A

Home, 2-bdrm., full dining rm., 1400 sq. ft., fireplace, detached 2-car gar., block wall, new ext. paint, landscaped, 3 miles to Norair, $23,500. L.A., PL 6-6845. A

House, 4-bdrm., 1¾ bath, utility rm., patio, built-ins, $37,750. P.V. Pen., 378-0120. A

Refrigerator & numerous other items, $20. Hawthorne, OS 6-1745. A

Accordion, 120-bass, Contello, $150. Gardena, 324-9132. A

Stove, gas, apt-size, 3½-yrs.-old, $30. Inglewood, 676-2958. A

Dressing Table w/mirror top, kidney-shaped, $4. Manhattan Bch., FR 4-8036. A

Eicycle, girl's 26″, new tires, $18. Gardena, DA 4-8853. A

Plymouth, 1964, Sport Fury, 383 cu. in., torque-flite, vibrasonic sound, p/s, p/b, extras, $2500. Manhattan Bch., 372-4951. A

Range, Kenmore, apt.-size, gas, deluxe, used 2 yrs., $35. Canoga Park, 340-7120. A

TV, Silvertone 24″, cabinet, 3 speakers, $75. Gardena, DA 4-4625. A

Ranchero pickup, 1964, V-8, p/s, 4-spd., $1699. Malibu, 457-2979. A

Chair set, 6 captain's, solid maple, $70. Rolling Hills Est., FR 5-6114. A

Divan & chair set, custom, 6-mos.-old, beige brocade, $275. Hawthorne, 676-0787. A

Chevrolet, 1959 Impala, conv., nylon top, p/s, w/w, $650. L.A. 62, AX 1-5280. A

Mobile Home, 1963 Accent, 10 x 55′, 1-bdrm., furn., 30′ alum. awning, air cooler, $4200. Orange, 637-4194. A

DeSoto, 1953 4-dr., r/h, auto., $50. Anaheim, PR 4-2779. A

Ford, Model A coupe, 1930, completely restored, eng. needs work, $450. Hawthorne, 675-0014. A

For Sale

House, 3-bdrm., 1½ bath, laundry & utility rm., block wall, sprinkling sys., newly redecorated, 2½ miles to Northrop, $23,750. Gardena, DA 4-1593. A

Pups, miniature Dachshund, AKC reg., 4-wks.-old, $55 & $50. Torrance, FR 5-1660. A

Jointer w/motor on stand, 4″ Craftsman, $50. Orange, 714-897-6992. A

Units, 4, deluxe, near Norair, 6-mos.-old, $69,500. Hawthorne, 676-6134. A

Dachshund, miniature red, female, 3-yrs.-old, $35. Gardena, DA 9-4675. A

Camper, 8′, slide in w/ice box, closet & dble. bed, 66″ high, $325. Yorba Linda, 528-5979. A

Yamaha, 1963, 55 mj2, extras, $175. L.A., 645-1523. A

Wanted to Buy

Bass Trombone. Culver City, VE 9-5438. B

Lawn Edger-Trimmer, elec. Harbor City, 325-0221. B

Comp. Hood for 1959-1962 Sprite, any cond. Lawndale, 371-3472. B

Shotgun, 12 or 16 ga., under $30. La Mirada, 714-521-1516. B

Cabinet, redwood, approx. 6′ x 6′. Hermosa Bch., FR 2-6556. B

House in Hawthorne, Hollyglen area. Hawthorne, OS 9-6247. B

Drafting Machine, Bruning. Redondo, FR 4-2915. B

For Trade

Organ, elec., Thomas, walnut finish, trade for piano in good condition. Box 403. C

Boat, 14′ Fiberglass, 5½-hp motor & trailer, trade for Bell RT 360 w/DK-1 accessory kit or equal tape recorder. Santa Ana, 543-0809.

Rentals Offered

Apt., 2-bdrm., unfurn., carport, 20 mins. to Northrop, 1 or 2 children ok, $90. Lynwood, 635-3784. E

Apt., 1-bdrm., 1½ bath, close to El Camino College, $95 unfurn., $110 furn. Lawndale, 322-1133, 370-6406. E

House, 2-bdrm., carpets, drapes, stove, $115. Torrance, 320-2002. E

Sleeping Room, util. paid, furn., near Northrop, pvt. entrance & bath, $45 mo. Hawthorne, 676-7328. E

Studio Apt., 2-bdrm., unfurn., 1½ bath, 2 blocks to Northrop, $125 mo. Hawthorne, 679-0622. E

Apt., 3-bdrm. studio, 2 baths, pvt. patio, closed gar., forced air heat, 2 children OK, $165 mo. Torrance, FR 5-0867. E

House, 2-bdrm., children OK, no pets, water & trash pd., $105 mo. Lawndale, 371-6775.

Apt., unfurn., 2-bdrm., pool. $125. Torrance, 323-1946. E

Duplex, 1 story, children & pets OK, range & refrigerator avail., fenced yd., $70 mo. Lawndale, 675-9389. E

Duplex, 3-bdrms., builtin range, $160. Torrance, 323-9349. E

Apt., 1 & 2-bdrm., unfurn., walk to Northrop, $95 & $110. Hawthorne, 675-2075. E

Rentals Wanted

House or apt., 2-bdrm., Inglewood, Hawthorne or beach. L.A. 47, 754-3962. F

Personals

We wish to express our gratitude for the many expressions of sympathy & offers of assistance received as a result of the loss of our daughter, Carole. Your desire to share our grief has touched our hearts & made these moments more bearable. MR. & MRS. A. R. SPRING.

Will do your typing in my home, term papers, theses, etc. Inglewood, 755-2436. L

For Sale or Trade

Chevrolet Impala, 1964 SS, 4-spd. pos. traction, $2150 or trade other car for my equity. Hawthorne, OS 6-7417. M

Chevelle Malibu S.S., 1964, 283 eng., 4-bbl., 4-spd., 10,000 miles, p/s, vibrasonic radio, w/w, $500 & take over $1850 bal. or trade equity for 1958 Chevrolet Impala. L.A. 43, PL 1-6203. M

Chevrolet pickup, 1964, all extras, low mileage, $1850 or trade for late model Volkswagen. Inglewood, OR 5-4905. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

8 a.m. — 4:45 p.m.

Crenshaw Blvd. & 180th St., Torrance. Bonnie Condon, ext. 617, 324-2435. 5

Rides Offered

8 a.m. — 4:45 p.m.

Crenshaw Blvd. & 180th St., Torrance. Bonnie Condon, ext. 617, 324-2435. 15

SAVING 'A MILLION FORTUNES' IS JUST ANOTHER SERVICE

Just another Northrop service?

Crew members at a Page Communications Engineers, Inc., station in the Western Caroline Islands think so.

When four of the crew spotted a Japanese ship in distress in Kombail Lagoon, they went out to see if they could help. A sick crewman had forced the ship to put into strange waters, and the captain had no seagoing charts of the area.

Pagemen called for Singeru Techur, station gardener at the Koror Pacific Scatter System site maintained by the Northrop subsidiary.

Mr. Techur piloted the ship to Malakal harbor 10 miles and two islands away.

The ship's name, "Man Ei Maru II," translates into English as "A Million Fortunes."

Ventura-Rocketdyne Gun Events Sunday

Trap shooters from Northrop Ventura's Rod and Gun Club are meeting with Rocketdyne for their annual contest Sunday at 9:30 a.m. The shoot will be held at the Trap Range in Dry Canyon which is near Saugus and about 1½ miles north of Boquet Canyon Road.

All shooters will be urged to participate regardless of their ability to break targets. Since the team won't be determined until after the shoot, every shooter has a chance to make the team.

The five highest scores will then be taken and those shooters will become the team and their total score will be compared to Rocketdyne's.

In other upcoming activities, the Club will hold its third annual Western Barbecue April 24, at the DAV Hall, 6543 Corbin Avenue, Woodland Hills, at 8 p.m.

Menu features deep-pit venison and beef including baked beans, cole slaw and garlic bread. Music for dancing will be furnished by stereo. Donation of $3 a person. All employees and guests are welcome. Tickets may be obtained from area boosters: Engineering — Matty Matheson, ext. 507; Administration — Sue Lilley, ext. 425 and Manufacturing — Dick Cronin, ext. 605.

Ventura Boat Club Maps Future Plans

Members of the Northrop Ventura Boat Club are mapping many special events to take advantage of springtime weather.

An Easter outing at Lake Havasu is planned for April 16-18 and a dinner meeting honoring mothers at Queens Arms May 6. Other sports, club news on page 6.

VENTURA NRC PLANS ADDED INCENTIVES FOR DUCAT BUYERS

For Ventura folk an added incentive has been added by NRC for the annual "Night at Disneyland" planned for all Northrop Corporation employees May 28.

First, Disneyland has been reserved just for Northrop people after 7:30 p.m. The $3.75 per ticket price includes use of all Disneyland facilities without further charge. Tickets for that affair are currently on sale.

Each Ventura employee who buys a ticket will fill out a special card. All cards go into a special container. At noon on May 21 a drawing will be held in the cafeteria from cards deposited.

The first four names drawn will receive reservations for two (May 28) at Disneyland Hotel. The next 100 cards drawn will be reimbursed for one ticket price or $3.75.

SUMMER KEG LEAGUES FORMING AT VENTURA

Summer bowling leagues for Ventura folk are now forming and offer a variety of nights and locations for those interested.

All leagues meet at 6:30 p.m. For special bowling news contact Zack Silvers, ext. 537.

On Tuesday nights a Men's Scratch league is slated for Conejo Bowl. Contact Dan Cashier, ext. 373, to enter.

Thursday night at Conejo Bowl a Mixed Foursome will roll. Contact Barbara Howe, ext. 420, or Marty Franks, ext. 687.

Friday night is reserved for a Mixed Foursome at the West Valley Bowl, Canoga Park.

CHESS

Norair's NRC Chess Club will stage a joint meeting with Western Air Lines Chess Club April 16 at the NRC Clubhouse (Camera Club facility).

DISASTER DRILL

Northrop Ventura's John Steman holds briefing (above) prior to full scale drill of Division's fire brigade. Captain Richard Wilson, Newbury Park fire chief (right) demonstrates proper method for coupling hose. Newbury Park fire station joined in drill this month (see story on page 1).

CLARY: Mariner Launched To 'Good Morning' Music

(Continued from Page 1)

ey's early morning program which featured a bright, simple good morning song. He began to sing.

At 3 a.m. on the 27th, the countdown began for takeoff. Launch was scheduled for 10 a.m. Since the launch team was on radio tieups with Cape facilities, tracking stations around the world and JPL at Pasadena, Hugh skipped his song.

An unexplainable abnormality occurred when a certain command was transmitted to the spacecraft and the launch was scrubbed. Extensive tests for hours failed to produce a recurrence and decision was reached to launch the next day.

At 3:15 a.m. on the 28th, the countdown began again. The test director spotted Hugh, shook his head a couple of times and picked up the microphone.

Addressing the entire tracking network, JPL control center and Cape Kennedy loudspeakers, the director quietly announced that he was taking full responsibility for what was about to happen. He handed the mike to Hugh and directed him to sing his song.

Following the song, there was silence in Australia, Africa and other tracking locations; there was silence in Pasadena. But the launch team cheered for the first time in 24 sleepless hours.

They cheered again six hours later when Mariner lifted off its pad in a perfect launch.

NSL Satellite En Route to Launch Site

The OV2-1 satellite, developed and built by Northrop Space Laboratories, is on its way to Cape Kennedy this week where it will be installed as a bonus payload on a development launch of the Titan III.

The satellite received a red-carpet sendoff last Friday as more than a dozen Air Force officers were the guests of Northrop President Thomas V. Jones, Vice President and NSL General Manager Dick Horner and NSL Vice President and Assistant General Manager Roy Jackson.

During the two-hour completion celebration at NSL, the Air Force guests received a complete briefing on the OV2-1, viewed a film on its development and were introduced to the project staff.

Testing of the satellite was completed the previous Monday, Program Manager Bill Armstrong said. Designed and built for the U.S. Air Force Office of Aerospace Research, the satellite will perform 14 space environment experiments.

At the ceremonies Friday each of the cognizant engineers—D. D. Shanks (systems testing), R. W. Mann (electronic systems), H. E. Hotz (mechanical systems), and A. L. Debolt (experiment integration)—introduced members of their respective staffs.

Ron Morin Heads Officers Elected By Ventura Club

Ron Morin heads a new slate of officers elected by the Northrop Ventura Golf Club.

In addition to Mr. Morin, who serves as commissioner, others named were: Fred Longo, vice commissioner; Joe Cosgrove, treasurer; Mike Antennucci, handicap chairman; and Lillian Goodwin, secretary.

Winners of the March 20 club tournament held at Green Tree Inn, Victorville, were: Lew Vinson, first and Roy Nickerson, second, in the "A" flight; Nelson Latraverse and Ron Ketchum, one-two in the "B" flight; Lyle Williamson, first, and Ed Steele, second, in "C" flight.

Barbara Forbes won the women's trophy, while Larry Gosh, Phil Chase, Lyle Williamson and Bill Strang placed in that order in the "close to the pin" standings.

Next club tournament will be April 17 at the Ojai Valley Inn.

BUT HE WINS HIGH JUMP

Hofmayer vs. Rattler: A Draw

Apparently the "battle" ended in a draw with both "contestants" profiting.

Nortronics Division's Ed Hofmayer has updated his knowledge of reptiles and is quite certain he set some sort of unofficial standing high jump record. And somewhere in the hitherlands there is a five-foot rattlesnake with a sore head and a firm conviction a hasty withdrawal is still the best policy.

Mr. Hofmayer, Earl Chambers, Del Mott, Gene Jessick, Bill Cornett and Dick Browder of Nortronics, along with Tony Brooks and Mike Craig of two local military organizations were in a remote area of Southern California on a survey mission last week.

En route, the talk got around to snakes and Mr. Hofmayer advised the group they had little to fear from rattlesnakes, since they traditionally are still in hibernation at this time of the year.

That was before he stepped right in the middle of a slumbering five-foot rattler.

Mr. Hofmayer executed his now-legendary leap up and down a steep incline, while the snake made a jump in the same direction. Both came to rest almost face-to-face. This time Mr. Hofmayer led in the respective evasive action maneuvers.

Mr. Chambers bounced a handy rock off the snake before it slithered down a hole.

Mr. Hofmayer was unhurt, although his pant leg bore the signs of snake venom.

The remainder of the survey mission was uneventful, although the party found pages from an October 29, 1931 Los Angeles Times with a full-page painting and a poem authored by Mrs. Calvin Coolidge. They also found other newspapers from the 1930's, numerous cattle bones, an old shack and the crumbling walls of an old adobe structure, presumably an old way station for the Butterfield Stage line that once crossed the area.

Ventura Recreation Club Good Time Table

For enrollment or information on activities listed below, call or contact Recreation Club, Ventura, ext. 480.

ARCHERY, Dale Milligan
Meet 1st Sunday, 10 a.m., Balboa Park Recreation area, Encino. Beginners with or without equipment welcome to free instruction.

BOAT, Gus Johnson
Meet 1st Thursday, 7:30 p.m. DAV Hall, 6543 Corbin Ave., Reseda.

BOWLING, Zack Silvers
Teams compete in leagues on Tuesday and Thursday evenings at Conejo Bowl, and Friday evenings at West Valley Bowl. No formal meetings.

BRIDGE, Tammy Tracy
Weekly bridge games at lunch period in cafeteria.

CAMERA, Dan Cashier
Meet 1st Monday, 7:30 p.m., 18146 Sherman Way, Unit 7, Reseda.

GOLF, Ron Morin
Monthly tournaments on announced dates with meeting at time of tourney.

RADIO, Bob Holly
Meet 1st Wednesday, 11:45 a.m. to 12:30 p.m., Engineering conference room 166. Amateur station is in ham shack at NV antenna range and is available noon hours to licensed amateurs.

RIFLE & PISTOL, Joe Letteriello
Meet 4th Sunday, 7 a.m., Camp Pendleton Range. Compete in Valley league tourneys and fields top marksmen in state and regional matches.

ROCKHOUNDS, George Rigby
Meet 2nd Friday, 8 p.m., 18146 Sherman Way, Unit 7, Reseda, to plan field trips and to use Club lapidary.

ROD & GUN, Dorothy Prychoda
Meet 3rd Tuesday, 8 p.m., DAV Hall, 6543 Corbin Ave., Reseda.

SPORTS CAR, T. F. Twitchell
Meet 1st Tuesday, 7:30 p.m., DAV Hall, to plan regular competitive events which occur on 3rd weekend of each month.

TENNIS, Bob Reese
To be activated approximately May 1.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California — Vol. 23, No. 5 — April 21, 1965

Full Schedule Awaits Visit Of Astronaut

Astronaut Charles Bassett, who one day may be scheduled for a flight to the moon, will meet many of the people May 3 who are building the parachute landing systems for both the Gemini and Apollo spacecraft programs.

Mr. Bassett

Astronaut Bassett is a member of the third group of astronauts named by the National Aeronautics and Space Administration in October 1963. In addition to training for future flight in space, he has been assigned technical responsibility in astronaut training and flight simulation.

His whirlwind visit to the West Coast will include a tour through the Northrop Ventura plant, a brief talk to employees, and an address before the Northrop Ventura Management Club in the company cafeteria.

Purpose of Astronaut Bassett's visit is to congratulate the Northrop team which developed the Gemini landing system and to stress the necessity for perfection in the development and manufacture of systems upon which the

(See BASSETT, page 6)

VIDEO LANDINGS OF SPACECRAFT MAY BE NEAR

Would you like to see as it happens the most beautiful parachute system in the world as it unfolds step by step in returning astronauts from space flights?

Work now in progress at Nortronics (Palos Verdes) on the Airborne Lightweight Optical Tracking System (ALOTS) may someday make it possible.

One application of ALOTS is to track and photograph outgoing and incoming spacecraft. The system, which includes high powered television cameras, could someday be linked up to commercial television — much in the same manner Ranger IX moon photos were aired live last month.

The ALOTS story appears on page 2 of this edition.

ROK GETS FIRST F5'S SENT TO FAR EAST

Initial deployment of the Northrop F-5 in the Far East moved one step closer early this month with the arrival in Korea of the first squadron of supersonic fighters destined for use by the Republic of Korea Air Force.

Joint announcements heralding the arrival were issued by U.S. Forces Korea and ROK Air Force headquarters. Both indicated turnover ceremonies will take place later this month.

In Korea the Northrop F-5 will be phased into the ROK Air Force as a replacement for aging F-86 fighters that have been the backbone of air defense in the Republic of Korea since the Korean War.

New Highway 101 Off Ramp Set for Construction in Fall

CROSS OVER TO BRIDGE

Trophy winners in recent bridge competition at Northrop Ventura were J. O. Powell (center) and W. F. DeMario (right), who are receiving trophies from Ken Pembroke, director of Games. Bridge buffs gather in cafeteria at lunchtime in continuing competition (see page 6).

WORK SCHEDULE AT EXIT SPEEDED BY SIX MONTHS

Construction is scheduled to begin next fall on a new off ramp which will ease traffic turns from Highway 101 into the Industrial Park at the Borchard Road interchange.

Schedule for the work was announced by Earl L. Thomas, senior state highway department engineer, on a recent visit to Industrial Park. Mr. Thomas indicated that the date for starting construction had been advanced by approximately six months.

Among Industrial Park leaders meeting with Mr. Thomas were Mr. H. E. Riggins, and Mr. Frank Tipton of Northrop Ventura who have been active in calling attention of state officials to the need of Northrop Ventura employees for improvements at the intersection in order to alleviate rush hour traffic congestion.

At the present time, westbound traffic entering the Industrial Park must loop around and enter Rancho Conejo Boulevard by turning left against Borchard Road traffic moving into the Industrial Park.

The new off ramp will curve directly to the right from Highway 101 in the direction of traffic flow into Rancho Conejo Boulevard. Mr. Thomas said the new off ramp will be open for use about six months after construction begins. He said the ramp is the first step in a longer range plan to form a complete cloverleaf interchange at Borchard Road.

Many Industrial Park employees now avoid the Borchard Road traffic jam by turning left off Highway 101 at Ventu Park. This has created a serious traffic hazard and has been responsible for numerous accidents. Mr. Thomas said that construction also is to begin this fall on an interchange and overpass at Ventu Park.

The engineer also told Messrs. Tipton and Riggins that widening of Highway 101 to a full eight-lane freeway from Calabasas to the Conejo is planned within the next two years.

Peace Corps Recruiters Scheduled for Northrop

Northrop will cooperate with Peace Corps officials in conducting an in-plant recruiting program, it was announced today by Corporation President Thomas V. Jones. At the request of Peace Corps Director Sargent Shriver, Northrop will schedule interviews next month for Washington representatives with qualified employees who have expressed interest in joining the Peace Corps.

Further details on interviews will be announced in the next issue of NORTHROP NEWS.

"The success of the Peace Corps in 46 developing countries has generated a growing demand for Americans with mechanical, manual and general administrative skills," Mr. Shriver wrote in his request for Northrop's assistance.

"To meet these demands, the Peace Corps is soliciting the active cooperation of American industry."

In his acceptance of Mr. Shriver's invitation to participate in the program, Mr. Jones wrote:

"I consider that all of us in industry should take every practical step in support of the fine work which the Peace Corps is doing . . . I sincerely trust that a useful program can be developed."

The Peace Corps is open to any American citizen over 18 years of age, provided he has no dependent children under 18. Corps criteria in no way rule out acceptance of sprightly grandfathers or former Northrop employees who have retired but still maintain administrative or technical skills.

150

(OR SO HE THOUGHT)

Fleming 'Retires' to Quiet Library

Jerry Fleming is almost sure his next job will be in marketing or contracts.

Since he's worked in most every other type of Northrop job, these two are about the only things left —that is, if his employment pattern of the past 15 years continues.

When he joined Northrop Anaheim Manufacturing in 1951, he left a lucrative jewelry business "for a lunch-pail job and a 40-hour week." But his powerful instinct for organization and administration led him through a succession of responsible jobs to his present position as supervisor of Northrop Ventura's Technical Information Center.

Mr. Fleming

At the time he transferred to Ventura Division from Anaheim after seven years, he had worked his way up from an instrument technician to a project tool engineer.

From project tool engineer on Ventura's SD-1 reconnaissance drone project he became supervisor of planning and tooling for all low-speed drone projects.

From there it was Manufacturing Control administrator, engineering administrator on the Apollo Program and, last year, he moved into the quiet, dignified atmosphere which characterizes the Northrop Ventura Library.

"It was quiet for two days," he recalls, "then I found out that there was more to the library than keeping books dusted and answering whispered requests for information."

To his amazement he found his duties were to:

—Maintain the Division's master security control center, which includes all classified material.

—Maintain the Division's document control center, which includes all technical reports, proposals, military specifications, and outside source documents.

—Maintain Division's brochure control, which includes logging and distribution.

—Mail handling for registered and classified material, technical reports and proposals.

—Research and reference center, which includes data searching and maintaining contact with outside sources of technical data.

—Or in his spare time, Mr. Fleming represents the Technical department for the Northrop News and Cost and Management Improvement Program.

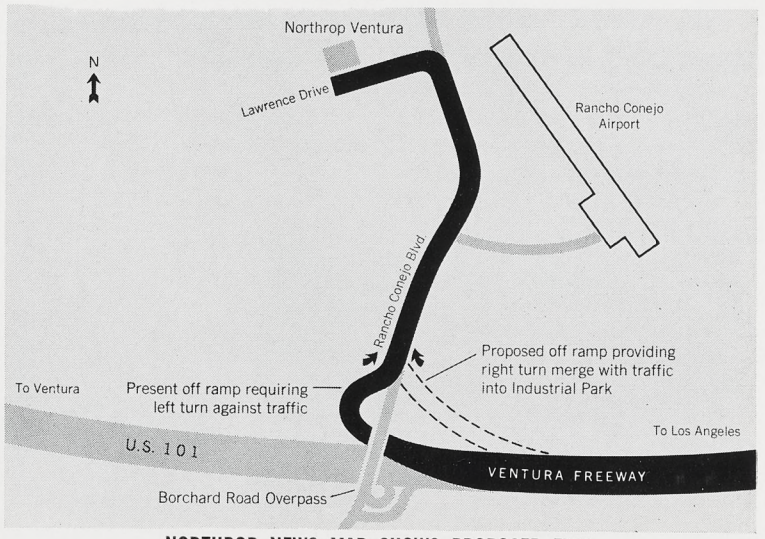
As Mr. Fleming's group maintains the Technical Information Center (TIC) which has been described by outside evaluators as one of the finest TIC's in the aerospace field.

Jerry had a good start in organizing the present Technical Information center (TIC), thanks to the late Mrs. Vivian Long, who brought many awards to the Division's engineering library.

Addition of new responsibilities, however, including expanded security control and information services, necessitated a new analysis and reorganization of the TIC.

"Housecleaning" over the past year has included a new area layout (both outside and in the security vault), combination of some functions, updating of tech-

(See LIBRARY, page 6)



NORTHROP NEWS MAP SHOWS PROPOSED EXIT.

ALOTS Begins New Era in Airborne Photography

NORTRONICS OPTICAL SYSTEM OPERATES ABOVE WEATHER

Memo to Major League baseball:

"If you're having trouble keeping track of tape-measure home runs because your sluggers are hitting the ball too far and fast to find, Northrop has a camera system which can automatically track the ball, give you high resolution television pictures and show closeups in such detail that grass stain on the ball is detectable—all from a distance of 12 to 15 miles away.

"The only drawback is you'll have to consider the prior claim of the Air Force, which awarded a contract for such equipment to Nortronics Division."

The system—called ALOTS (Airborne Lightweight Optics Tracking System) — is scheduled for its first operational tests in six weeks, prior to delivery in July to the Air Force Eastern Test Range.

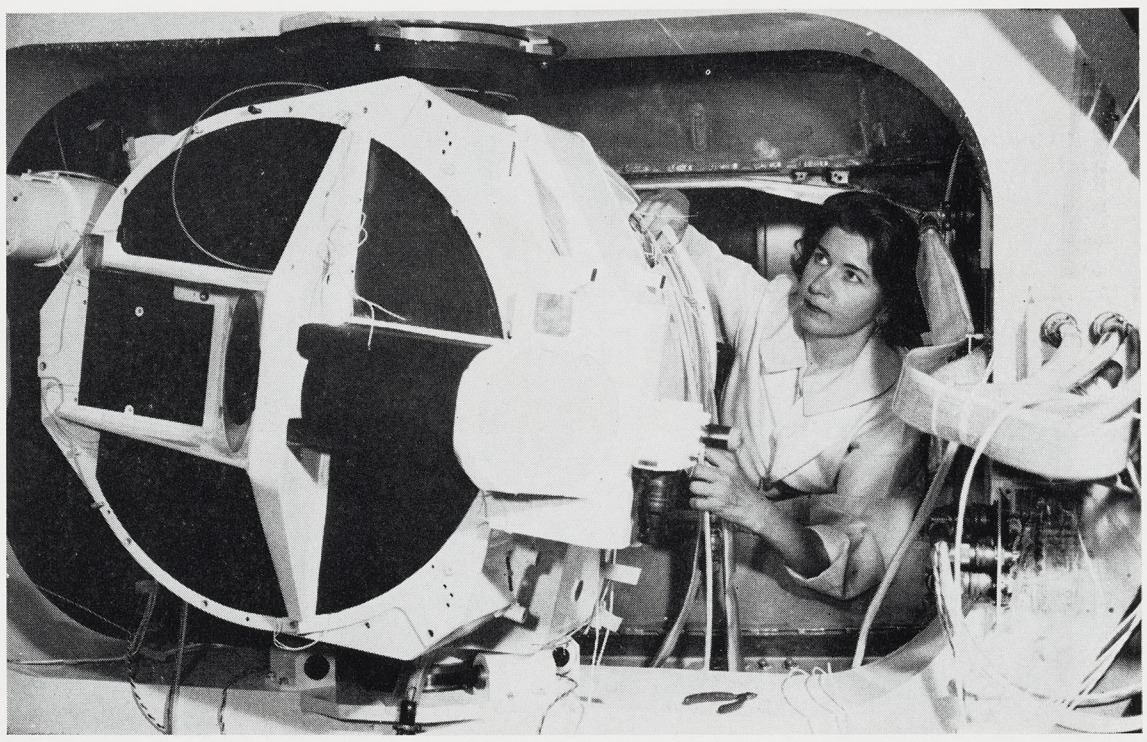
AFETR is more interested in tracking missile shots than baseballs, even during photography-inhibiting weather conditions. ALOTS fills the bill by operating from 40,000 feet, which is above 75 percent of the earth's atmosphere.

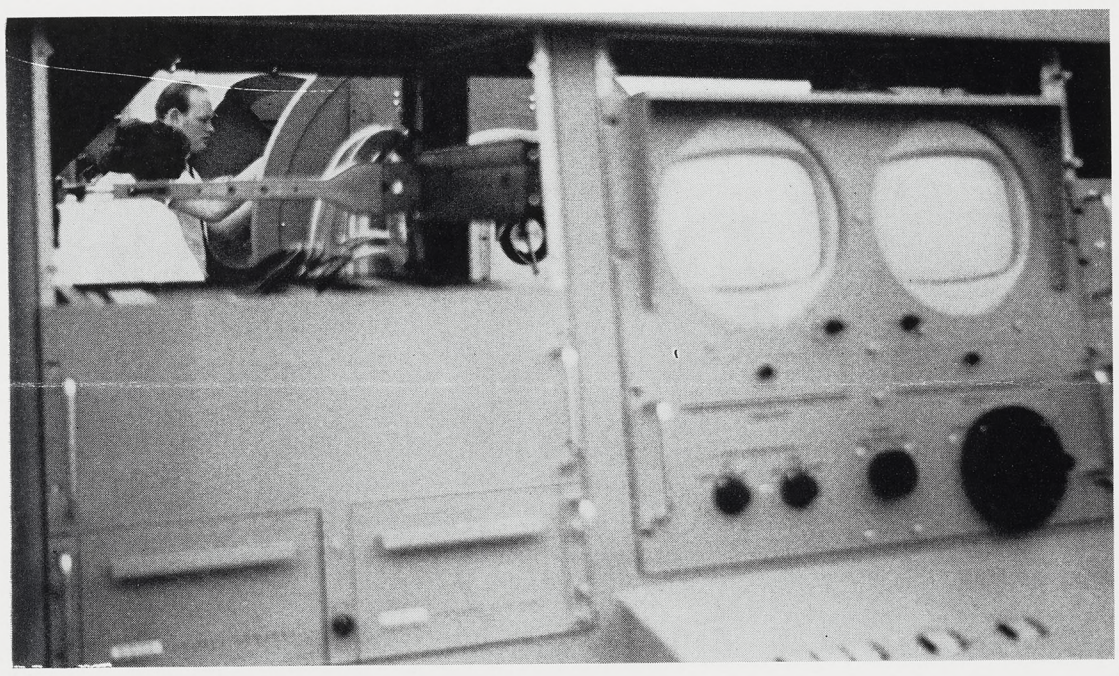
The camera system is designed to photograph missiles during the early launch, passage through the high dynamic pressure region, staging separation and re-entry phases of flight.

Included in the ALOTS package are a manual tracking station, an automatic tracking system, a photographic system and a control console.

Specific components include a 200-inch focal length telescope, a 70 millimeter photo-

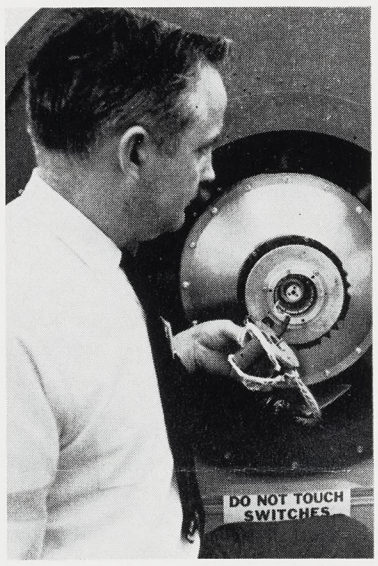
(See ALOTS, Page 5)



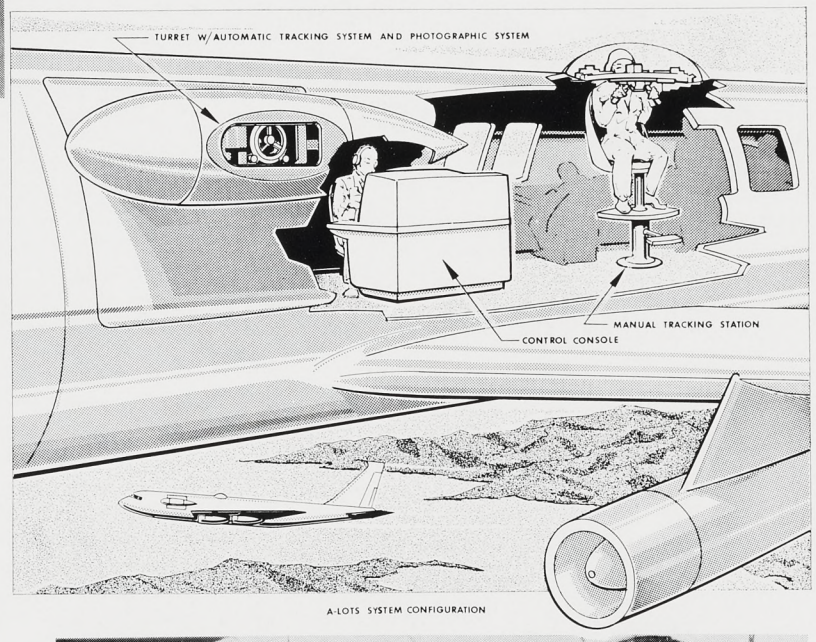


INSIDE THE POD

Technician Betty MacKenzie wires automatic tracker and photographic system, one of three components of ALOTS system. Mounted on turret inside pod, automatic tracker will be attached to door of cargo plane. Control console (left) when completed will be installed inside the plane. Technicians working on pod are seen through missing panel. Entire system is depicted (below) in artist's concept.



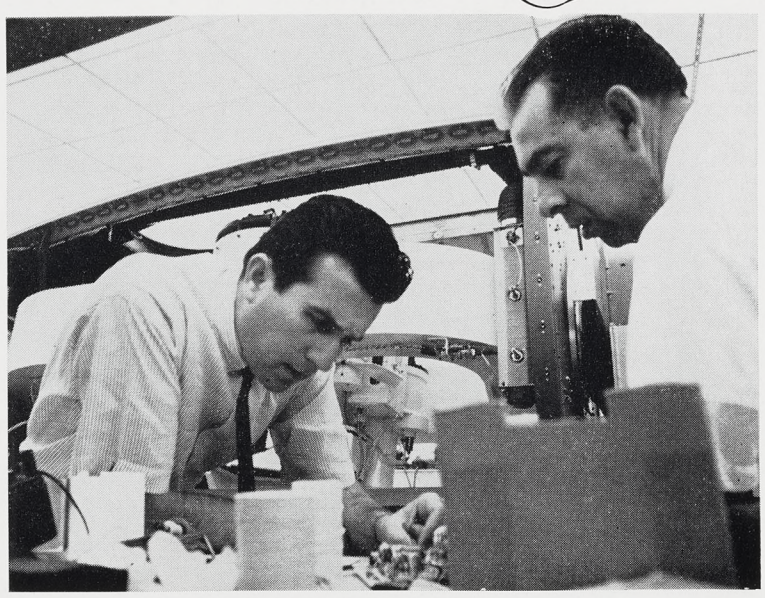
Vere Moesser



A-LOTS SYSTEM CONFIGURATION

BREADBOARD MODEL

Two-axis tracker, described as breadboard model for ALOTS system, is set up for test assignment at Cape Kennedy (below). Nortronics' Dave Conklin (second from left) reported complete success in tracking recent Gemini and Ranger IX flights. Air Force technicians (left) at Cape see missile in flight in real time with Nortronics - built photographic-tracking system.



Mario Artavia (right) sniffs for smoke.

FOR LESSONS WELL LEARNED—Initial participants in a special Industrial Work Experience program receive certificates on completion of Norair-based work period from C. Z. Stine, supervisor of Industrial Training. Graduates (from left) are Dorothy McGlothen, Ruth Robbins, Ann Madison and Gilbert Lanoix. Second group of eight students is now in similar program.

Second High School Group Starts On-the-Job Training

Northrop Norair has welcomed its second group of students taking part in a special Industrial Work Experience program. The students, four boys and four girls, are all full-time students at either Manual Arts or Dorsey high schools and are in their 11th or junior year.

From 8 to 10:30 a.m. each weekday they are at Norair to gain actual on-the-job training. The girls work in such functions as Personnel, Communications, Mail Service or filing activities, while the boys' time is divided between assignments in Tool Engineering and Fabrication. They will continue their Norair association throughout the remainder of the current school semester.

The students are afforded a rare opportunity to observe industry in operation. And they receive credit through their schools for their part in the program.

Their Norair training is one-half of a special course. The other half consists of classroom studies. The entire program is aimed at motivating the students to take additional courses, as a result of their observations, they will better prepare them for potential jobs in industry following graduation.

Norair began its association with the program in February as one of the first industrial firms to support the concept. At that time four students (from Manual Arts) began a similar work schedule, graduating April 9.

Studies are currently under way to determine if the Northrop participation can be expanded still further to include other schools and still more students.

Norair exercises no control over the selection of students, other than specifying that those picked by the school be average youngsters making average grades.

Administration for the program is provided by the Norair Education and Training group of Industrial Relations through C. Z. Stine, supervisor of Industrial Training.

HUNTSVILLE MAN IN SYMPOSIUM

Contracts Administration Supervisor Robert Langford of Northrop Space Laboratories' Huntsville section recently participated in the second annual Southeastern Symposium on Government Contracts at Cocoa Beach, Fla.

Mr. Langford is the current president of the Huntsville chapter of NCMA.

CMIP Savings Hit $40 Million; Continued 1965 Support Urged

EDITOR'S NOTE: As one of the most important continuing activities at all Northrop divisions, the Cost and Management Improvement Program will be reported by the NORTHROP NEWS in a series of in-depth articles, as well as news and feature stories.

With the addition of figures from the first six months of fiscal 1965, Northrop brought its total savings in the Cost and Management Improvement Program since formal implementation in 1963 to more than $40 million, it has been announced this week by Ken Hornor, Corporate coordinator.

Mr. Hornor

The most recent Corporate report to the Department of Defense revealed $3.78 million in savings tabulated to date in fiscal 1965.

This year's total includes 584 separate items accepted and documented by all divisions and offices. Contributing to cost reduction were activities such as value analysis, systems and procedures, suggestion awards, operation roundfile, automated operations control, cost and price analysis, and budget administration.

The over-all Cost and Management Improvement Program (CMIP) was established in 1963. Consequently, as one of the few companies experienced in such a full-scale program, Northrop cooperated with DOD officials in their setting up of official DOD guidelines in 1964, which defined an effective contractor cost reduction program.

The Corporation tallied more than $22 million in savings the first year and last year logged more than $14 million.

"At the present time," Mr. Hornor said, "the Corporation is under its goal. However, reports from Division coordinators indicate that the backlog of reports that have not been processed as yet will bring us close to our goal by the next report."

However, he added, the need for increased attention on reporting savings still remains during the remainder of the current reporting period.

Divisional representatives on the Corporate CMIP committee are Warren Sparks, Norair Division; Bob Irving, Northrop Space Laboratories; Bob Barrett, Nortronics; and Les Hudson, Northrop Ventura.

Richard R. Nolan, vice president-Manufacturing and Administration, in addressing a meeting of division coordinators this month, reported that President Thomas V. Jones was still committed to his pledge of December 1963 "that efforts of every individual associated with Northrop would be directed with new emphasis to the achievement of high quality production at the lowest possible cost on all government contracts."

Mr. Nolan, who was instrumental in getting the original CMIP started when he was general manager of Norair Division, told coordinators that "while we support the DOD program, it should be noted that the primary benefit is to Northrop."

"In view of the company benefits and our commitments to the government, it is essential that we continue to have an effective CMIP," he said.

Norair Division, which last year exceeded its goal by 22 percent, has set a goal of $7.2 million this year.

According to Division Coordinator Sparks, Norair was running slightly under its goal at the end of the second quarter.

"There has been considerable delay during the past quarter in preparing individual reports due to the large scale proposal activity in progress," he said, "but we feel our record will improve during the third quarter."

Mr. Sparks further reported a backlog of 750 active suggestions.

"This coupled with a full slate of pending value analysis projects should be sufficient to put us back on schedule by the end of the third quarter," he said.

TWENTY-ONE BOXES PER SHIP—Lena Baker, left, and Foreman Dick Economy look over a few of electrical relay boxes used on T-38 and F-5. Mrs. Baker submitted suggestion that eliminated masking operation, saving four minutes per box, plus materials. She earned $103 award.

Eliminating Step Wins Cash Prize For Lena Baker

A Norair Division inspector, Lena Baker, recently parlayed sound reasoning and initiative into a nice personal award ($103) through the Suggestion Award program.

Mrs. Baker noted the 21 electrical relay boxes used on each T-38 and F-5 were going through an unnecessary step. That is, masking was being applied to one side while Glyptol enamel (for insulating) was being painted on, then taken off and applied to the other side while Epoxy enamel (for appearance and durability) was being applied.

Her idea was to eliminate masking by first spraying on Glyptol, then Epoxy, since an overspray of the latter did not affect the former.

Her idea saved four minutes per box, plus the cost of masking materials.

You Can Still Buy Ice Capade Ducats

Tickets remain on sale through Northrop West Coast facilities for the special May 5 (opening night) performance of Ice Capades at Los Angeles Sports Arena.

Regular $3.50 tickets sell for $2.50.

Northrop folk will occupy a select group of loge seats in observance of a 25th anniversary being enjoyed this year by both Northrop Recreation Club and Ice Capades.

Tickets are available through Personnel Activities offices or Personnel offices at Norair, Nortronics, NSL and Northrop Architectural Systems; at the Ventura cafeteria; through Kelly Burke at Edwards AFB; Tom Post at Palmdale; Kay Cribbs at the Corporate office; and Polly Middleton at Mariposa Warehouse.

SPRING FITTING FOR NAS

Ex-Norair Man Sets Up Third Plant

There's a lot of difference between aircraft and sliding glass doors, but Ralph Froelich, production manager at Northrop Architectural Systems, still gives credit to his 10 years at Norair Division for his ability to set up a manufacturing plant for the Northrop subsidiary.

NAS growth since 1959 is reflected in Mr. Froelich's record —organizing three plants in six years in addition to his responsibilities in day-to-day production.

The newest facility is beginning to take shape in the City of Industry with construction scheduled for completion in July. While design of the production layout is wrapped up, Ralph is directing his attention now to transferring the whole operation from present facilities in the City of Commerce with a minimum of down time.

Mr. Froelich

Ralph's confidence in an orderly transition is bolstered by the fact he did it once before. When NAS moved to its present location from South Los Angeles in 1961, production facilities were transferred on weekends and not a single order was delayed.

The present situation is a little more difficult because of increased magnitude of equipment involved and a higher volume of backlog.

But procedures are being worked out to move equipment in sections and keep part of the assembly line running in Commerce while parts are being installed in Industry.

By operating out of two plants at once during the transition, Mr. Froelich believes there will be no interruptions in the steady line of trucks and rail cars carrying the Arcadia line of doors, windows and store fronts from NAS to market.

Fifteen years ago, Ralph was expressing the same confidence about shipping F-89's out of Norair at Hawthorne. He joined the Division in 1940 as leadman in sheet metal. He moved up to foreman and later joined a modification group for evaluation of aircraft performance, before being "borrowed" by Monrovia Aircraft Corporation in 1945 to set up production facilities there.

Back to Northrop in 1956, Ralph was general foreman of Sheet Metal Fabrication and was part of the group which began Norair's development work in titanium.

His background in production and metals made him an excellent choice in 1959 to organize and head an expanded manufacturing operation when Northrop purchased Acme Metal Molding Company.

The present challenge is the

(See FROELICH, page 5)

Ross Miller Co-Chairman For Seminar

Nortronics Vice President Ross Miller, has been selected by the American Management Association to serve as co-chairman of a workshop seminar concerned with "advances in program and project management."

The seminar will be held in San Francisco during a two-day management conference sponsored by the AMA on April 26 through 28. Mr. Miller who is manager of the Nortronics Division Technical department will share the session chair with Charles Martin of Douglas.

The two aerospace executives are particularly qualified to chair the management workshop session due to the leading roles they played in the development of the Skybolt missile. Mr. Miller was program manager for the Skybolt guidance system, while Mr. Martin was responsible for liaison with the British Government in behalf of the missile's prime contractor.

Instrument Society Sounds Papers Call

Leaders of the forthcoming (October 5-7) Eleventh National Aerospace Instrumentation Symposium to be held at the Ambassador Hotel are seeking persons interested in presenting papers.

The theme will be "New Measures of Progress in Aerospace Instrumentation" and papers should cover interesting new developments in aerospace instrumentation.

Norair's Henry M. Karaszewski, ext. 1933, is Los Angeles County chairman for the event.

MAYOR MAKES IT OFFICIAL—Northrop Coin Club, which is joining other numismatic groups in observance of National Coin Week April 24 through May 1, called on Hawthorne Mayor James Q. Wedworth (seated) to have official proclamation signed. Holding proclamation is Ann Hall, a Coin Committee member of Chamber of Commerce. Standing behind, (from left) are Frank Farmer, Northrop Coin Club president; Bob Hartman, Chamber secretary; and Foster Hall, Chamber Coin committee member.

NRC Numismatists Join National Observance

Whether for judging or jingling, coins will be in the limelight next week as Northrop Coin Club joins fellow numismatic enthusiasts across the nation in observing National Coin Week.

Theme this year is "Good Will Through Numismatics."

NRC's Coin Club will take part by exhibiting at various Hawthorne locations several displays of member's coins. One is made up entirely of silver Peace Dollars, another shows U.S. and foreign coins appropriately mounted on a world map.

Last week, as a prelude, Northrop Coin Clubbers called on Hawthorne Mayor James Q. Wedworth to witness a signing of an official proclamation declaring April 24 to May 1 as "National Coin Week" in Hawthorne.

SHIFTS WILL SHIFT FOR TIME CHANGE

Northrop Corporation employees in California will be affected by the switch to Daylight Saving Time, which occurs Sunday, April 25.

All California clocks will be set ahead one hour at 1 a.m. Sunday. Thus, normal work shifts for the following week will begin on the new time schedule or one hour earlier than the previous week.

X-21 Suggestions Earn Cash for Edwards Trio

Suggestion awards totaling almost $1000 have been paid a trio of Norair Division men at Edwards Air Force Base for their "Yankee ingenuity" as applied to the Northrop X-21 Laminar Flow Control (LFC) aircraft.

Each suggestion was different but involved the plastic filler material (Kemweld) used to build up certain areas of the LFC wing to required contours. This material is applied, then sanded to desired finishes.

Stan Lowry, an experimental flight test mechanic, worked out a special sanding tool which consisted of a turnbuckle adjustment enabling it to be fitted to various contours. Each man working on this type operation now has one or two units which improve quality and reduce time. Mr. Lowry received $796 for his efforts.

Robert Lane, a second experimental flight test mechanic, suggested thin shims, used to keep filler material out of wing slots, be cut to pre-determined width so that they also acted as gages to control filler thickness as it is applied, reducing subsequent sanding time. He earned $141.

Tom O'Malley, a Northrop pilot of company planes that serve Edwards AFB, noted some difficulties during sanding operations due to sharp contours and unusual shapes. He worked out an aluminum-back sanding unit with a flexible polyurethane buffer onto which sandpaper was attached. This enabled the men to shape the sanding unit to fit tight shapes, then reshape them for other shapes. He received $38 in Suggestion Award money.

Milt Kuska, Norair deputy assistant general manager — Technical, made a special trip to Edwards AFB to present checks and thank the men for their efforts. He was joined by Jack Farley, base administrator, and Roy Whites, supervisor of Experimental Flight Test.

Norair Gals Win Posts in Election By Secretaries

Half of the officers elected this month by the Airborne Chapter, National Secretaries Association, are Northrop Corporation employees.

Miss Weltman

They include: Marianne Weltman, president; Marge Stevens, first vice president; and Verlin Seaman, corresponding secretary. All are from Norair Division.

Elections were held April 8 and installation is set for June at the Fox Hills Country Club.

Meanwhile, the Northrop members are taking part in National Secretaries Week (April 18-24) and today (April 21) will participate in the formation of a new Beverly Hills chapter they have sponsored. Keynote address will be delivered by George Gore, Corporate vice president, general counsel, and secretary.

LITTLE FEET PATTER AT NSL

Life scientists at Northrop Space Laboratories this week were celebrating a special kind of Mother's Day a month early.

"After two years of frustration," zoologist Jerry Gambino said, "the NSL Life Science Department has scored a scientific first — the breeding of pocket mice in captivity."

There are two new mothers actually, each with a litter of four one-half inch long *perognathus longimembris*.

It was touch and go for two weeks after delivery, Dr. Gambino reports, but earlier this month the potential astromice explored their artificial desert environment for the first time as they moved outside their tin-can nest.

Staff researchers couldn't wait until the regular Mother's Day next month because family life is short-lived for pocket mice.

"Being solitary animals to an unusual degree," Dr. Gambino said, "the children turn on their mother about six weeks after birth. After driving her away they then fight among themselves for territorial rights."

Pocket mice are so inhospitable, he added, that no one knows yet how they stop fighting long enough to reproduce.

Aside from the zoologists' interest in the animal's behavior, space scientists are excited about the possibility of using them in space environment experiments.

Pocket mice don't drink water, exist comfortably for long periods of time in dark, cramped quarters and are smaller than other species now being used. They also have an unusually high tolerance to radiation.

Under contract to the National Aeronautics and Space Administration, NSL has been conducting continuing experiments and studying pocket mice for two years. The laboratory has also designed a space capsule which is tailored to *p. longimembris*.

Breeding the mice in a laboratory environment is essential in establishing a genetic history of future astromice. Other species presently being used are identified by their genetic strain (which may be traced back 50 or more generations), which allows scientists to more accurately determine the effects of experiments as well as allowing other scientists to duplicate their work with subjects from the same strain.

The Life Science staff was also interested in laboratory reproduction because members have frequently had to trek out into the Southern California deserts to round up a supply of pocket mice.

Recent successes were attributed to many months of around-the-clock surveillance by the staff and physiologist Page Hayden's injection of a new hormone in both male and female mice.

Reminded that Father's Day comes around in June, Dr. Gambino forecast little recognition for the two unsung heroes of the story.

It seems that a mother pocket mouse regards a father pocket mouse as some kind of worthless rat and expels him even before the young are born.

"What's this? Another photographer."

"His name tag says Bill Cox."

"I mustn't look afraid."

CLICK!

DIAMONDS FOR HIS LAPEL

Bob Johnston (left) is first employee of Ventura Division to receive Northrop 25-year pin. A senior designer, Mr. Johnston worked many years at Norair Division before transferring to Ventura. Vice President and General Manager George Douglas makes the presentation.

ALOTS: New Era Begins In Airborne Photography

(Continued from Page 2)

graphic camera operating at 80 frames per second and two vidicon sensors for tracking.

Automatic tracking and photographic systems will be integrated in a single mechanical assembly contained in an external pod mounted on the aircraft cargo door. Lockheed Aircraft Corporation is under contract to provide design modifications to aircraft which carry ALOTS.

The sensors cover both coarse and fine fields of view. After the coarse field (4 by 4 degrees) acquires the missile, the fine field (40 by 40 minutes) goes into operation and is the same as that seen by the recording camera of the photographic system.

All monitoring and control facilities not included in the manual tracking station will be provided by the control console. Two video monitor screens on the console display to the operator the coarse and fine tracking fields.

The Air Force has been interested in this type of equipment for some time, according to Project Engineer Jack Gantz. AFETR has been experimenting with existing equipment in order to determine prerequisites.

"This is the data we began with nearly a year ago," Mr. Gantz said, "and while Nortronics' system is relatively simple, there were a tremendous number of engineering challenges involved."

Responsible engineers helping to solve the problems were LaVere Moesser (mechanical), Jaime Oaxaca (electronic) and Bert Johnston (systems).

In designing and building ALOTS, the men overcame such obstacles as: airborne stability of the platform which holds the cameras; attaching the system to an aircraft; satisfying aerodynamic require ments yet retaining a wide field of view; design of windows to withstand temperature extremes yet not cause changes in critical focal length; and keeping operating personnel at a minimum.

With applications for the system continuously being developed, it will probably be a long time before baseball gets into the act.

FROELICH

(Continued from Page 3)

most difficult and probably the most rewarding, Mr. Froelich says.

Once moved, NAS will have a "model" production line. Addition of process steps, such as anodizing, will make the plant more self-sufficient. Production will be on a straight line arrangement from initial order to shipment and will reduce inventory, he added.

Best of all, for Ralph anyway, the new facilities should last a long time. NAS is more than doubling its acreage, and facilities include provisions for adding further process steps at a later date.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Wilmington Blvd. & Anaheim, Wilmington. Tom Henrich, ext. 680, 2138, TE 5-9070. 2

7:30 a.m. — 4:15 p.m.

Imperial & Main, El Segundo. Susan Taylor, ext. 1995, EA 2-0367. 3

8 a.m. — 4:45 p.m.

Covina Area, Pomona. Duane Heise, ext. 2255. 5

Rides Offered

7 a.m. — 3:45 p.m.

Avalon & 190th St., Gardena. Genaro Chapa, ext. 2568, DA 3-9447. 12

8 a.m. — 4:45 p.m.

Covina Area, Pomona. Duane Heise, ext. 2255. 15

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Ski Boat, 16′, Corvette motor, front & rear seats upholstered, trailer, $1995. Torrance, DA 9-9407. A

Skis, Blizzard metal slalom-type, 210 cm., $49. P.V. Pen., 377-5936. A

Cemetery Lots, Glen Haven Memorial Park, San Fernando, Sunny Slope sec., $600. Gardena, 327-4519. A

Bicycle, boy's 10-spd. Derailleur, $25. Inglewood, PL 5-4497. A

Cadillac, 1961 sedan DeVille, 37,000 miles, $1950. Fullerton, 714-529-3416. A

Refrigerator, Coldspot, 7.3 cu. ft., $25. Torrance, DA 5-3724. A

Height Gage, 12″ Browne & Sharpe, $45. Hawthorne, LO 7-3663. A

Dishwasher, Kenmore portable, faucet attachment, $75. P.V. Pen., 377-5319. A

Dishwasher, Kitchen Aid, $65. Torrance, 375-2290. A

Air Compressor, Ige., Devilbiss, model 225, 30 lb. to 150 lb. pressure, $300. Inglewood, OR 8-2733. A

Studebaker, pickup, 1956, deluxe cab, 228 V-8 eng., column shift, o/drive, new tires, r/h, $425. Hawthorne, OS 5-1787. A

Yamaha YDS-3, 1965, 250 cc, auto. oil injection, $550. Norwalk, 864-7673. A

Camping Trailer, 16′, $350. Hawthorne, OS 9-1550. A

Home, custom 3-bdrm., 1½-bath, sep. dining room, Ige. fenced lot, Hollywood Riviera, $31,500. Torrance, 375-528. A

Buick, Roadmaster, conv., 1956, fully loaded w/extra equip., rebuilt eng., $175. Anaheim, 535-3305. A

Chris Craft, 14′, 16 hp, Mercury, trailer, spare tire & life jackets, $200. San Pedro, TE 1-3483. A

Lots & Cabin, Big Bear, water, elec. avail., $3825. Manhattan Bch., FR 2-3878. A

Pontiac, Catalina, 1964 conv., auto. trans., p/s, p/b, bucket seats, radio w/rear speaker, $2995. Santa Monica, 393-7464. A

Cessna Membership in Flyers, Inc. of Hawthorne, $300. L.A. 43, GR 3-9897. A

Dodge, 1958 9-pass. wagon, Sierra, r/h, full power, new tires, elec. rear window, $450. Torrance, 320-2827. A

Automobile Oil Filter, Luber Finer, complete, $5. Hawthorne, OS 5-5805. A

Pontiac, 1963 Grand Prix, factory air, full power, alum. wheels, $2950. Torrance, DA 4-8618. A

Movie Camera, Bolex 8mm titler & access. kit & editor, Bell & Howell 8 mm w/splicer, $125. L.A., 645-6556. A

Bunk Bed, captain's, w/2 drwrs., & cabinet space, maple, $50. Manhattan Bch., FR 4-3394. A

Buick Special wagon, 1962, auto. trans., power rear window, $1400. Inglewood, OR 3-4274. A

Tent, Genie 9′x12′ Air Kool, dble. door, floor, $30. Hawthorne, OS 9-4933. A

Twin Beds, dresser, night table w/21″ screen console TV, $125. Inglewood, 678-3318. A

Plymouth, station wagon, 1959, p/s, $350. Granada Hills, EM 5-7338. A

Home, 3-bdrm., 1¾-bath, Ige. living room w/P.V. stone fireplace, utility room, fenced yard, $21,500. Walteria, 378-7742. A

Rambler Wagon, 1963, Classic 660, r/h, auto. trans., V-8 eng., new w/w tires, reclining seats, $1995. L.A., 326-6539. A

House, 2-bdrm., carpet, on R-3 lot, 50′x130′, low down pymt., $25,950. L.A. 56, AX 2-9489. A

Ford, Galaxie 500 XL, 1964 conv., auto. trans., $2300. Buena Park, 521-5047. A

BBQ, w/glassed-in oven & motor, utility shelves & plastic cover, $15. Gardena, DA 7-0872. A

Scooter, All-State, 3-spd. trans., luggage carrier, $140. Redondo Bch., FR 5-6439. A

STEREO, FM & AM, Granco, multiplex, 2-yrs-old, 20-watt unit, complete w/speakers, $70. Compton, NE 8-2222. A

Chevrolet, 1959, 4-dr., r/h, auto. trans., power steering, $695. Hawthorne, OS 5-4786. A

House, 2-bdrm., attached gar., large lot, $18,950. Torrance, FA 8-1872. A

Table, round, 4 chairs, chrome, $20. Inglewood, OR 7-2962. A

Volkswagen, 1961, $1050. Torrance, FR 1-3044. A

Horse, 6-yr-old white mare, ½ thoroughbred and ½ quarter horse, papers, 16 hands, trained English, western, jumping, $450. Rolling Hills Ests., 377-2101. A

Chevrolet, Malibu s/s, 1965, 4-spd. trans., r/h, tach., many extras, $2800. Hawthorne, 676-5012. A

For Sale

Home, 3-bdrm., 1½-bath, block wall, h/wood floors, corner lot, less than 2 miles from Anaheim facility, $16,950. Fullerton, 528-6914. A

Chevrolet, pickup, 1960, Ige. bed, hvy. duty, $1000. Hawthorne, OS 5-2403. A

Bicycle, 24″, boy's, $15. P.V. Ests., FR 5-5097. A

T-Bird, 1959, Cruise-O-Matic, p/s, p/b, $1050. Whittier, OX 8-4740. A

TV, Zenith conso'e, 23″, 2-yr-old w/remote controls, $119. Hawthorne, OS 5-7938. A

German Shepherd, 1-yr-old, tan & grey, $20. Fullerton, 714-529-4788. A

Chevrolet, Nomad, 1956 Classic sta. wagon, orig. owner, $850. Venice, EX 6-3594. A

Stove, reg. size, Wedgewood, chrome top, $40. Hawthorne, OS 5-4322. A

Washer, Hotpoint automatic, $25. L.A., 757-4252. A

Cemetery Plot, Inglewood, Greenlawn section, adjoining, $350. Hawthorne, OS 6-8842. A

End Tables, coffee table set, mahogany, glass tops w/2 hand-painted porcelain lamps, $50. Pacoima, 882-0761. A

Bar, 8′, carved, upholstered in olive green, complete w/4 stools, $25. Inglewood, OS 5-7050. A

Refrigerator 9′, Philco, freezing compartment & door shelves, $90. Inglewood, 677-4540. A

Front Door, 35½″ solid core birch w/hardware incl., deluxe doorknob w/2 keys, $10. Gardena, 675-1005. A

Piano, upright, practice-type, full-size keyboard, cherry finished, $80. Manhattan Bch., 379-5366. A

Apts, deluxe, 4 units, 3-bdrm., 1½-bath owner's unit, w/w carpets, drapes & built-ins, close to shopping & schools, $57,500. Lawndale, 322-1133, 370-6406. A

Boat, 17′ 8″, V-8 60 inboard w/trailer, 4 life preservers, many extras, $700. Playa del Rey, EX 1-4860. A

Dodge, 1956 Coronet Lancer, 2-dr., p/s, recent o/haul, $295. Gardena, DA 9-2904. A

Chair, leather, red, large, $60. Thousand Oaks, 498-2867. A

Cadillac, sedan, DeVille w/air cond., all power, $350. Van Nuys, ST 4-2332. A

Washing Machine, 14-lb. capac., Norge, $135. Anaheim, 828-2440. A

Stereo, Wayfarer, for auto., 4 speakers, tapes, electronic track changer, $125. Downey, TO 2-9547. A

Cadillac, 4-dr., r/h, $195. Northridge, EM 3-1679. A

Ski Boat, Glen L. Missal, 16′ inboard w/trailer, $1500. Anaheim 714-776-8907. A

Auto Parts, 1960 Sunbeam, 2-dr., wrecked out front end, no radiator or front fenders, o/drive trans., $265. Compton, 635-3294. A

Washer, Kenmore, 2 speeds, $50. Hawthorne, OS 6-1048. A

Cabin Cruiser, 23′ Fly-Brdg, 150-hp Intercepter, bait tank, outriggers, sleeps 2, 6′ dinghy, 30-watt s.s. radio, $2300. Inglewood, OR 1-9591. A

Coffee Maker, Universal, $7.50. Downey, 923-8532. A

Chevrolet, Bel Air, 1961, r/h, stick shift, $725. Orange, 637-4194. A

Monza, 1962, bronze, $1200. Anaheim, 638-2857. A

House, 5-bdrm., 3½-bath, fireplace, gar., fenced yd., near grade school, 2800 sq. ft., $26,000. Pasadena, SY 5-0215, SY 4-7334. A

Crib, w/dbl. dropsides & Baby Pedic mattress, $28. Gardena, 327-2279. A

Sofa, Naugahyde, white, $20. Redondo, FR 5-0061. A

Camping Equipment, 9′x11′ tent, ice chest, extras, $135. L.A. 56, AX 3-0036. A

Tent, 9′x12′, hvy-duty canvas, $40. Manhattan Bch., FR 4-8036. A

TV, 21″ Magnavox, light walnut cabinet, about 6-yrs-old, $75. Gardena, 757-2383. A

Sleeping Bags, w/hvy-duty rubberized nylon air mattress, king size, 42″x48″, 3-lb. Dupont 88 Dacron, 2 air mattress pockets, bags zip together, $46. Torrance, 323-4257. A

Cabin Cruiser, twin outboard catamaran, 20′ long, 8′ beam, 2 50-hp Evinrudes, trailer & many extras, $2400, Torrance, DA 4-0341. A

Ski Boat, 18′, Chrysler powered, $3500. Norwalk, SP 6-1281, UN 5-8863. A

Dodge, Lancer, 1962, 770, 4-dr. sedan, r/h, w/w, auto. trans., $800. Reseda, 342-0362. A

Plymouth, 1955, 2-dr. sedan, r/h, auto. trans., 1-owner, $175. Torrance, FA 8-6839. A

Oldsmobile, 1963 Starfire, 22,000 actual miles, full power, all extras, $2300. Inglewood, OR 1-6702. A

Oldsmobile, Cutlass, 1964, V-8, auto. trans., p/s, p/b, r/h, w/w, $2550. Torrance, DA 9-5364. A

Home, 4-bdrm., family room, 2-bath, fireplace, pool & decking, fully landscaped, separate play yard, 2-car gar. w/hobby rm. area, $25,500. Santa Susana, 526-6804. A

Schnauzer, miniature, male, 6-mos-old, ears cropped & shots, champ. background, $175. Anaheim, 714-776-8956. A

Couch w/2 chairs, $100. Torrance, FR 5-2127. A

Oldsmobile, F-85 station wagon, 1961, V-8, auto. trans., r/h, w/w, $1375. San Pedro, TE 3-9455. A

Baby Bed, adjustable sides, $12. Hawthorne, 329-9484. A

Dog, poodle & scottie mix, 1-yr-old, female, black, $15. Gardena, 324-3760. A

Buick, Riviera, 1963, factory air, all power, Cruise-O-Matic, tilt-wheel, bucket seats, all extras, $3295. Inglewood, 671-3154. A

Refrigerator, International Harvester, 9 cu. ft., freezer across top, $75. Rolling Hills, FR 7-1094. A

Honda, 1965, model CA 95, under 1300 mi., $50 & take over pymts. or $500. Gardena, 676-5505. A

Tire Chains, 2 pr., one fits 700-15, 800-15, 900-14, other 760-15, 850-14, $12.50. Compton, NE 1-3627. A

Projector, 35 & 120 mm Davidson professional model, 500-watt, telephoto & wide angle lens, assemblies included, $30. San Pedro, TE 3-6037. A

Wanted to Buy

Tool Box, rollaway, also tools. Gardena, 4-9904. B

For Trade

Gun, Ruger 9-shot semi-automatic, trade for single-action revolver, any caliber. L.A., PL 7-7911. C

FREE (To Be Given Away)

Puppies, black, 6-wks-old, 3 males & 2 females, cocker spaniel-type. Lawndale, 323-0583. D

Poodle, silver grey, pedigree, papers, miniature, male, 2-yrs-old. Compton, 633-7740. D

Kittens, part Siamese, black, 1 all white, ready on or about May 21. Inglewood, 672-5578. D

Rentals Offered

Cabin, Green Valley Lake, by week or weekend, $35 weekend, $65 wk. Torrance, 320-2002. E

Apt, 1-bdrm., unfurn., garage, pvt. patio, near transportation, $78.50 mo. Gardena, DA 9-9195. E

Apt, 1-bdrm., deluxe, built-ins, pool, $90 mo. Redondo Bch., 376-2117. E

Apt, 2-bdrm., unfurn., all elec., pvt. garage, water & trash paid, $120 mo. Inglewood, 671-4310. E

House, 2-bdrm., sep. dining room, glass-louvered back porch, $125 mo. Rolling Hills, FR 7-4926. E

Apt, unfurn., 2-bdrm., 1½-bath, tub incl., laundry fac., plenty of cabinets & closet space, close to freeways & shopping, $105 mo. L.A. 44, PL 5-0630. E

House, 3-bdrm. & den, 2-bath, pvt. patio, $175 mo. Compton, NE 5-3250. E

House, 2-bdrm., close to shopping, water & trash pd., pvt. yard & gar., children ok, $100 mo. Lawndale, OS 9-8426. E

Home, 2-bdrm., furn., all elec., dble. gar., Ige. lot, in Vista, $85 mo. Gardena, DA 1-7623. E

Apt, gar., 2-bdrm., upper, laundry fac., 3 blks. to King Harbor, $125 mo. Redondo Bch, FR 5-4436. E

Apts, 1-bdrm. & 3-bdrm., unfurn., pvt. patios, closed gar., $95 & $165 mo. Torrance, FR 5-0867. E

Apt, 2-bdrm., deluxe, dble. gar., children acceptable, $125 mo. Inglewood, 672-7855. E

Studio Apt, 2-bdrm., unfurn., 1½-bath, 2 blocks to Northrop, $125 mo. Hawthorne, 679-0622. E

Unit, owner's, 1800 sq. ft., 3-bdrm., 3-bath, family rm., fireplace, pvt. deck & 3-car subterranean gar. w/storage, built-in kitchen, soft water system, adults, $275 lease. Redondo Bch., 373-1143, 673-3298. E

Home, modern 2-bdrm., paneling, natural wood cabinets, fenced rear yd., water & trash paid, lease or $115 mo. Gardena, 374-6331. E

Apt, deluxe, unfurn., 2-bdrm., 2-bath, dish washer, fireplace, free hot water, play yard, 2 children ok, near Norair, $135. Hawthorne, 679-1358. E

House, 2-bdrm., trash & water paid, children ok, no pets, $105 mo. Lawndale, 371-6775. E

Child Care Offered

Child Care, licensed, playroom, hot lunches & snacks, references, $3 day. Hawthorne, OS 5-1884. G

Found

Contact Lenses, set, in white plastic case in K parking lot. Norair Plant Protection, ext. 1972. J

Personals

Interested Person share monthly cost, approx. $4.25 mo., New York Times newspaper, daily at Norair main gate, except Sunday. LO 9-9306. L

Thank You for all the good wishes sent our way during the past couple of weeks. MR. & MRS. L. H. WALTON. L

For Sale or Trade

Shotgun, J. C. Higgins model 20, pump, $60 or trade for small outboard engine, 3½ to 12 hp. Compton, 635-2747. M

Mini Bike, 3-hp Briggs & Stratton, $50 or trade for b-flat tenor sax. Gardena, DA 4-7209. M

NORTHROP NEWS

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MISSION ACCOMPLISHED

Northrop Ventura members of Gemini team still find it difficult to stop talking about successful flight last month. This group (from left) includes Bob Provart, project engineer, Clyde Rockey, contract administrator, Stan Gewant, program manager, Bob Parmett, contract administrator, Bert Engstrom, former project engineer, and Russ Torgeson, project engineer.

NSL Awarded 2nd Contract To Build OV2 Bonus Satellite

Northrop Space Laboratories will design, develop and fabricate another OV2 space environment "bonus" satellite under terms of an $885,600 contract just announced.

Designated the OV2-3, the satellite will be built for the U.S. Air Force Office of Aerospace Research.

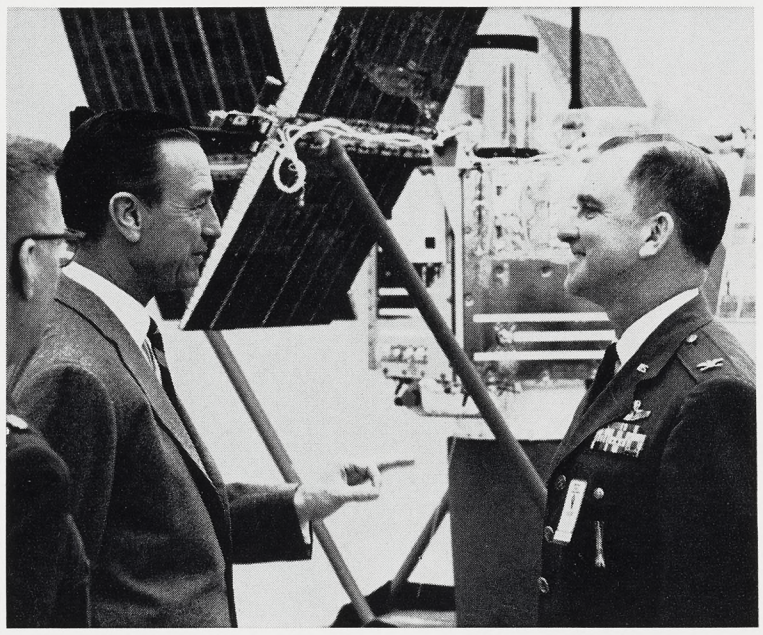
Working on the project will be the same NSL team—headed by Program Manager William C. Armstrong—which was responsible for the development and fabrication of the OV2-1, first Northrop-produced vehicle of the series.

The OV2-1 vehicle is currently at Cape Kennedy awaiting launch later this summer aboard a Titan vehicle.

Both the OV2-1 and OV2-3 vehicles have the same general configuration and dimensions, measuring approximately four feet square by seven feet high and employ a number of common subsystem equipment, affording reduced costs.

Like its predecessor, the OV2-3 is currently programmed to be launched as a bonus payload on a development flight of a Titan IIIC vehicle. Launch date will be set later this year.

Under terms of the new contract, NSL will design, develop and fabricate the OV2-3 and integrate into it 14 separate experiments. NSL will also assist the Air Force in monitoring the vehicle during its first month in flight while training USAF personnel to take over for the rest of the satellite's useful life, nominally set at one year.



SATELLITE OK ALL THE WAY—Or so Thomas V. Jones (left), Northrop president and chairman, seems to be telling Colonel David V. Miller, Titan III project director for Air Force Space Systems Division, during completion ceremonies for OV2-1 bonus satellite. New contract calls for NSL to design, develop and fabricate second vehicle, designated OV2-3.

LIBRARY: Technical Info Center at Ventura Division

(Continued from page 1)

nical data and source material to reflect new areas of research and product lines, and initiating of TIC bulletins to library users.

"I am not a librarian," Jerry says and emphasizes the contributions made by the staff specialists, which include Vera Johnson, Betsy Sturm, Marge Raine, Ruby Sessions, and Ruth Weiss.

Mr. Fleming appears to have reached the TIC goal which, in general, is to make it possible for Northrop Ventura engineers and scientists to get any printed information they need by merely picking up the phone and dialing 1083.

That's why Jerry can look at the past year's work with a watchmaker's pride. Or is it a tool engineer's pride? Manufacturing Control administrator? Project office administrator? Could it even be a librarian's?

ASTRONAUT

(Continued from Page 1)

lives of spacemen will depend.

He will arrive at the Los Angeles airport at 1 p.m. and fly by helicopter to the Northrop Ventura facility at Newbury Park. Accompanying him will be Fred Asselin of the NASA Headquarters Office of Public Affairs, Washington, and Henry Blazer, NASA plant representative at Northrop Ventura.

Upon arrival the astronaut will meet briefly with George F. Douglas, vice president and general manager, and other division executives before touring the factory and engineering building at about 2:30 p.m.

At approximately 3:30 p.m. he will give a brief address to all division employees in the mall.

The Management Club dinner will begin at 6 p.m. Mr. Douglas will introduce Astronaut Bassett who then is scheduled to speak on the subject of "Management in Action."

Born in Dayton, Ohio in 1931, Astronaut Bassett has logged 3200 hours of Air Force flying time, including 2600 hours in jet aircraft.

He served as an experimental and engineering test pilot in the Fighter Projects Office at Edwards Air Force Base.

TOOTH FOR TOOTH

In the Moonlight She Searched

Who else but a mother whose son has just had his three front teeth knocked out would be down on her hands and knees crawling in a darkened parking lot at 1 o'clock in the morning?

"Anyone who saw me there would have thought I was losing my mind," says Nortronics secretary Jean Buchanan, "but actually I was finding something — my 16-year-old son's teeth."

After "crying for four days and nights" when son Lauren came home with a big toothless grin last month, Jean was just settling down to her first restful sleep in a week. She bolted up about midnight and, "driven by an irresistible urge," grabbed a flashlight and, still in her robe, drove to the scene of her son's fateful fracas.

As luck would have it, she found the two incisors and a canine, and they weren't gummed up too badly from four days in a parking lot.

Jean couldn't control her excitement and ran straight to a telephone to call her dentist.

"I found them," she cried, "can I bring Lauren down right now?"

The dentist was also excited, but suggested that after four days another few hours wouldn't make any difference. Jean didn't know it at the time, but if she had found the teeth within 30 minutes after they were knocked out, nerve and blood vessel connections could have been restored. As it is now, Lauren has his teeth, but they will only last about 10 years.

Regardless, a delicate operation then restored Lauren's complete smile.

The dentist praised Jean's determination, but Jean is convinced it was divine inspiration that sent her out to the parking lot in the wee hours.

Bridge Players Keep Cafeteria Buzzing With Life

Some play it for relaxation, others look on it as a competitive sport.

Regardless of their outlook, bridge players are often described as a "breed apart"—always ready to play, always seeking a game.

Northrop Ventura Bridge Club offers an unusual opportunity for players to practice their skills, meet other enthusiasts and enjoy bridge unlimited.

For instance, about 30 people gather in the cafeteria each lunch period to try their luck. And each Thursday at 7:30 p.m. another cafeteria session is open to husbands, wives and friends.

The NRC Bridge Club is affiliated with the American Contract Bridge League (ACBL), an organization with over 200,000 members. The latter holds three National, Regional (California has three each year), Sectional (Los Angeles has 25 annually), local and club level tournaments. One of the biggest held each year occurs during the Memorial Day holiday period and draws some 40,000 players to the Ambassador Hotel in Los Angeles.

The latter is just around the corner and the Ventura Bridge Club hopes to send entries to compete in the Commercial and Industrial pairs as well as the Team of Four Championship division.

All tournament play is "scratch" and each player faces his drawn opponents, regardless of standings. For this reason, novices often match brains and cards with men like Charles Goren, Oswald Jacoby, et cetera.

This, then, is one of the lures of bridge, competitive style.

Interested?

If so, Northrop Ventura Bridge Club would like to have you turn out. Contact either NRC Commissioner Tammy Tracy or Director Ken Pembroke for further details.

WHICH ONE IS SAM?

Although outnumbered almost two to one, these Northrop Ventura trap shooters came within two points of a Rocketdyne team in a contest April 11 at San Fernando Gun Club. Final score was 213-211. Team members, with the exception of Joe Sliakis and Les Hudson, are shown above (from left): Don Kohn, Earl Muehlenbach, Paul Lawrason, Marian (Sam) Weller, Jack Bean, George Conley, Rusty Rursch, Sue and David Lilley. Miss Weller was most disappointed member of team. "I was on my way to a perfect score," she said, "and then I hit one."

150

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 6 | May 5, 1965

TRIPPING THE LIGHT

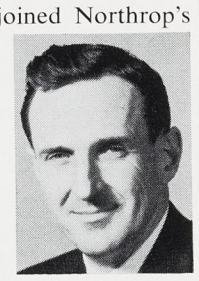
SPRING DANCE held April 3 inaugurated use of Northrop Ventura cafeteria for NRC affair. Typical of the many who enjoyed the evening are the couples above, from left, Paul Hoeper and Ruby Steeb, Dan and Willo Cashier, Barbara and Thomas Howe.

George C. Grogan Succeeds Hicks As VP-Technical

George C. Grogan, jr., an engineering and marketing executive associated with Northrop since 1959, has been named vice president-manager, Technical department, at Ventura Division. The appointment, effective May 1, was announced today by George F. Douglas, vice president and general manager of Northrop Ventura.

Mr. Grogan succeeds Dr. Donald A. Hicks who has held the position since 1961. Dr. Hicks now heads a new Applied Research department of Northrop's Nortronics Division.

Mr. Grogan joined Northrop's Norair Division in April 1959 and most recently has been assistant manager of the Marketing department. Prior to that assignment, he had served as chief of Aero Sciences, chief of Aero and Propulsion Sciences and director of Research and Technologies.



Mr. Grogan

Before joining Northrop, Mr. Grogan was a senior group engineer with the Convair Division of General Dynamics at Ft. Worth, Texas. During World War II he served with the U.S. Navy in the Pacific Theater.

A native of Oklahoma City, Mr. Grogan received a B.S. degree in mechanical engineering from the University of Oklahoma in 1945. His Master of Science degree in aeronautical engineering was obtained in 1948 from the Massachusetts Institute of Technology.

The new vice president is an associate fellow of the American Institute of Aeronautics and Astronautics. He also is a member of the Royal Aeronautical Society and the National Aeronautics and Space Administration's Research Advisory Committee on aircraft aerodynamics.

Dick Nolan Elevated to Senior VP

Richard R. Nolan, who came to Northrop more than 25 years ago as one of its first employees, has been elevated to the post of senior vice president, Manufacturing and Administration, of Northrop Corporation, it was announced today by Thomas V. Jones, president and chairman.

Mr. Nolan has been Corporate vice president for Manufacturing and Administration since January 1965. This post is being raised to the level of senior vice president because of the importance of the functions it embraces.

Mr. Nolan was vice president

(See NOLAN, page 6)

MR. NOLAN

Two-Week Drive Announced for 150 Suggestions

A goal of 150 money-saving ideas has been set for a two-week, concentrated campaign May 5-19, it was announced this week by the Northrop Ventura Employee Suggestion Awards committee.

The special campaign allows a series of evaluations of each suggestion and could lead to four different prizes, according to Committee Chairman Ken Geller.

Cigarette lighters, free baseball tickets, cash and free lunches are among awards to be given out.

Everyone who submits a suggestion will automatically earn an engraved lighter, Mr. Geller said.

ROCK HOUNDS

Northrop Ventura Rock Hounds will gather for a regular meeting at 8 p.m. May 14 at 18146 Sherman, Unit 7, Reseda. Featured will be films made in Hawaii by John Lawrence.

Research Group Transfers To Nortronics Division

A new department — to be known as the Applied Research department — will be added to the Nortronics Division, according to a joint announcement by Thomas V. Jones.

Dr. Hicks

Heading the new department will be Dr. Donald A. Hicks who has been vice president-Technical of the Ventura Division and who will become a vice president at Nortronics, reporting to Mr. Stevens.

The new department will conduct investigations in the physical sciences with special emphasis on weapons effects.

Dr. Hicks will take with him to Nortronics a team of about 40 specialists in nuclear effects who until now have been assigned to the Research and Advanced Technology section of Northrop Ventura. This team of experts has done outstanding work in studying, detecting and measuring the effects of nuclear blasts.

Dr. Hicks has named Dr. Walter Crandall to be assistant department manager and Dr. Theodore Hallman to be director of advanced technology. Both have been key research executives at Northrop Ventura.

The new department will continue to be housed at Northrop Ventura until arrangements are completed for the move into a building in the Rancho Conejo Industrial Park near the Ventura Division plant.

UP FROM SCRAP

J-A Designers Vie for Top Honors

Selection of a firm sponsored by Northrop Ventura as one of nine finalists in the running for the Southern California Junior Achievement "Company of the Year" has been announced.

The 19-member firm, called Conejo Designers and Producers, has already been named the best company in its category in a contest sponsored by the Los Angeles Junior Chamber of Commerce.

Announcement of winners in the over-all contest was expected this week.

Four Northrop Ventura men have served as advisors for the group. Edward S. Babcock, now of Northrop Space Laboratories, was instrumental in organizing the firm. Serving as advisors since September have been Dick Davis of Cost Accounting, Doug Finch of Graphic Arts, and Doug Sessions of Reproduction Services.

Each man devoted several hundred hours to the youngsters since September, helping them organize, select and procure materials, then produce and market products. Regular manufacturing sessions were held once each week.

The youngsters turned out highly successful Christmas candles, emergency flare kits and printed place mats and handbills.

Production of the kits really started from scratch, or scrap if you prefer, the advisors reported.

Wooden stands for the flares were fashioned from scrap lumber; warning flags were made from leftovers of Ventura Division's Paradynamics lab; wire shafts to support the flags were made from coat hangers.

The firm is currently in the process of liquidation with a promise of healthy dividends to shareholders.

Northrop Ventura has sponsored the only Junior Achievement firm in Ventura County for the past two years. Both Mr. Davis and Mr. Finch have served as advisors both years.

(See photo on page 6)

JONES URGES FULL NORTHROP SUPPORT OF 1965 FREEDOM BOND CAMPAIGN

Northrop will participate in the 1965 Freedom Bond campaign, sponsored by the U.S. Treasury Department and private industry, it was announced this week by President and Chairman Thomas V. Jones.

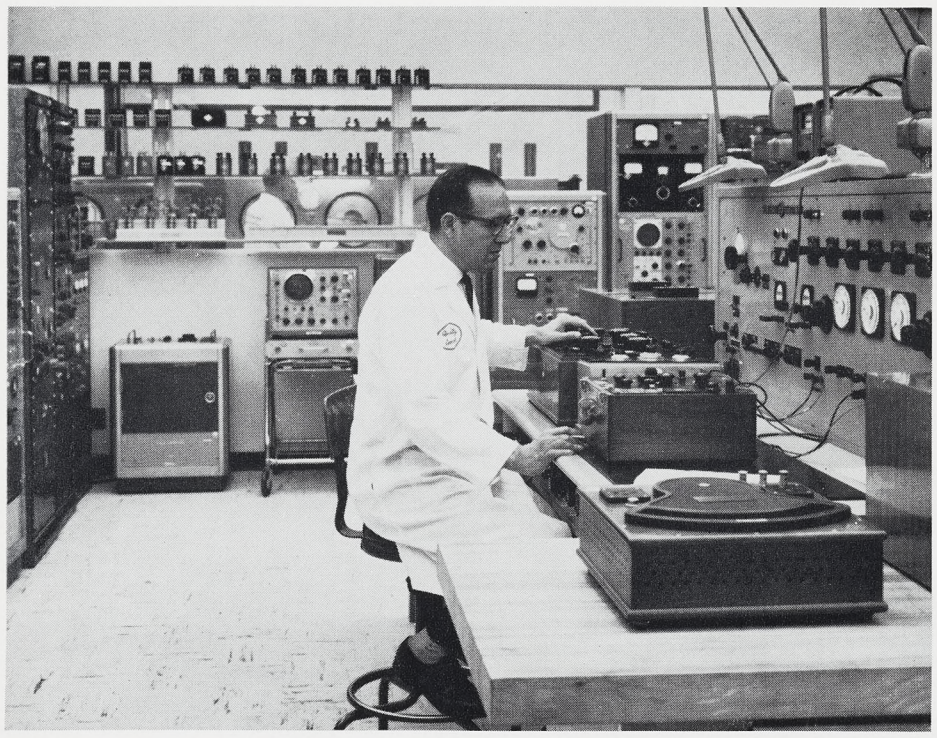
The coast-to-coast drive, which emphasizes payroll savings by employees of industrial firms, has as its national goal this year the enrollment of 1.1 million savers.

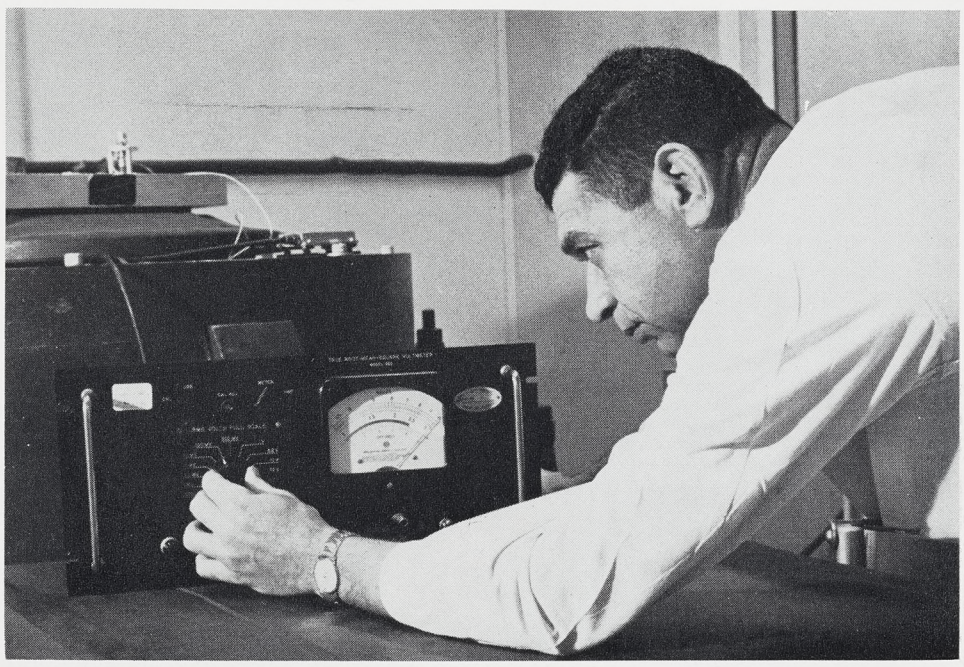
In a message to all personnel at all divisions, Mr. Jones said:

"Our largest customer, the United States Government, through the Treasury Department, has asked Northrop to support this year's Freedom Bond campaign through payroll deduction and I have assured them that we would do so.

"In addition to the fact that this is an important request from our customer, I regard our participation as a patriotic duty and one which we should support wholeheartedly. Moreover, each of us should have a plan for establishing a regular savings program. I know of no better way to do this than through investment in bonds of our government.

"Northrop has a nation-wide reputation for having achieved the highest participation in our industry with 99.6% of our people subscribing to savings bonds. I hope that all of you will make every effort to help us maintain this high standard."





Surrounded by equipment used to certify test instruments is Phil Flores (left photo) of Norair Standards lab. Jim Bell (right) is conducting vibration test at Ventura.

StAndard, Standard, WHo's GOt tHe standaRd

Everyone on the Northrop payroll knows that each component or part that goes into a Northrop product is checked, rechecked and guaranteed.

Everyone also knows that there are hundreds of instruments throughout the Corporation which are used for checkout.

But who checks the checkout equipment? And who checks the equipment that checks the equipment that checks the equipment?

These are not common questions. But they are asked by Air Force pilots zipping through clouds at supersonic speeds with hundreds of pounds of explosives on board; they are asked by astronauts moving at 17,000 miles per hour from outer space toward a one-square-mile speck of hard, cold water; they are asked by seamen cruising below the ocean's surface with a battery of Polaris missiles and a nuclear reactor for company.

The answer is evident on the Northrop instruments used to certify their equipment. Chances are they'll find a bright red decal which includes the word "certification" and the logotype of one of Northrop's Metrology laboratories.

The decal means that a group of experts at Nortronics, Norair or Ventura divisions have once again ventured into that obscure world of infinitesimal measurement, evaluated the instrument's performance beyond the scope of everyday understanding, and issued its own brand of insurance policy backed up by the Northrop name and reputation.

Reference Standards is only one part of over-all Metrology responsibility, but it's the one that makes sure the cookie doesn't crumble and that the ball bounces the way you want it to.

The prime mover in the cosmology of measurement sciences is the National Bureau of Standards, a government agency.

Metrology's Reference Standard units are responsible for maintaining a set of standards, provided by the NBS, for use in certifying instruments which in turn are used to calibrate production and test equipment.

Sound as simple as 1, 2, 3?

Okay. How do you measure 1/10,000,000 of an inch?

How do you measure 1/100,000 of one degree Centigrade?

How do you measure 1000 volts to an accuracy of .15 parts per million?

To better cope with increasing pressure on the limits of man's and machine's capabilities, Northrop Metrology units are engaged in a vigorous program of assessing interdivisional capabilities and establishing procedures for interdivisional cooperation.

The Corporate Quality Control committee has established a Metrology working group composed of section chiefs from each division. Norair's Art Ohlemacher is chairman this year (the chairmanship is rotated annually) and members are Phil Painchaud of Nortronics (Anaheim) and Harry Vickers of Northrop Ventura.

"In order to begin a program of pooling technical skills," Mr. Ohlemacher said, "there was a great deal of administrative groundwork to be laid.

"Many sessions were devoted to just finding out how we could help each other. From the long list we developed, we have to date put into effect such things as exchanging lists of reference standards equipment; standardization of major definitions, terminology, decals, and definitions of implementation; establishment of divisional responsibilities for maintaining reference standards, and many more."

Considerable savings to the Corporation have been recorded from assigning responsibility for certain standards to each division rather than each division maintaining capabilities in all areas.

Assignments are traced to product lines as much as possible.

A blanket interdivisional work order has been set up to enable each division to perform work for the others.

At Anaheim, Nortronics Metrology has a going commercial business in standards and calibration with a couple dozen paying customers in related fields. Services provided by Mr. Painchaud's group include instrument calibration repair and procedure writing.

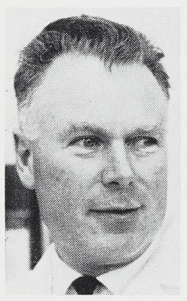
Nortronics' capabilities in pushing Reddi Kilowatt to the state of the art have caused

(See STANDARDS, page 5)

THE CHIEFS

Harry Vickers Ventura

Art Ohlemacher Norair



Phil Painchaud Nortronics

Bookcase in Norair Metrology lab contains instrument manufacturer's manuals. This is only about one-fourth of voluminous literature which must be maintained by metrologists.

Nortronics (Anaheim) cuts cost, makes more equipment available with common pool of test equipment. Vito DePaul (photo at left) checks out one of nearly 4000 pieces now in stock. Metrologists view of metrologists (right) is depicted by Harold Leff in former publication, "Metrology News and Notes," at Anaheim.

"I'm reassigning you Cranston,
You've been reading meters long enough."

Gemini IV Pilots Fitted For Chutes

America's second team of Gemini astronauts, scheduled for two days of orbital flight early in June, last week received a final fitting of their personal parachute harnesses by Northrop Ventura.

Astronauts James A. McDivitt and Edward H. White were fitted by Northrop Paradynamics Test Engineer Lew Vinson at Weber Aircraft Company in Burbank, where Gemini emergency ejection seats are built.

At Weber the astronauts were up to their neck in moist sand, which hardened to provide a cast for building tailor-made seats and back supports.

In addition to the main parachute landing system, Ventura Division developed the escape system parachutes. The harnesses are worn like a jacket and are tailor made.

The two astronauts were fitted earlier at the Newbury Park plant of Ventura Division, but modifications to their pressure suits, as well as seat cushions, necessitated a final fitting.

Astronauts James Lovell and Frank Borman, back up pilots to Mr. McDivitt and Mr. White, also received seat and parachute harness fittings last week.

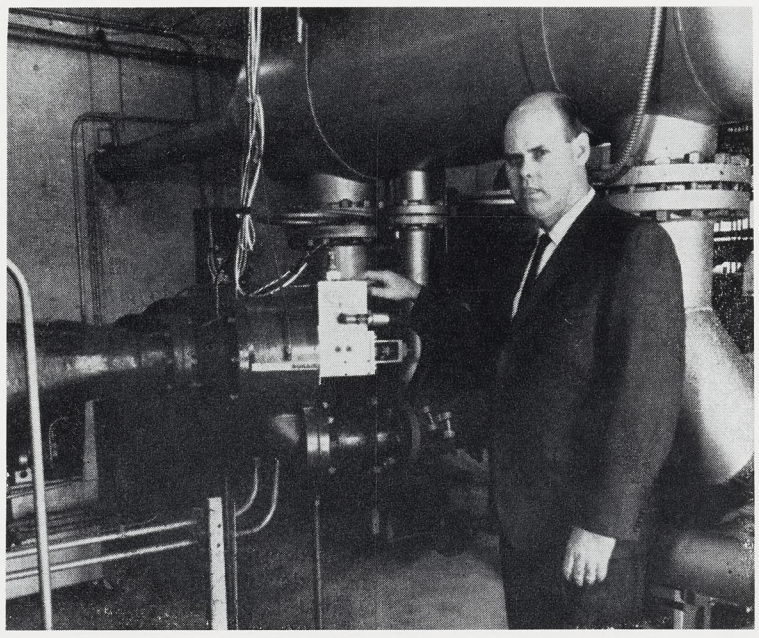
Art Club Slates Exhibit, Art Film

Nortronics (Anaheim) Art Club Commissioner Ed Mosher has announced an interesting "Carnevale de Art to be held at 7:30 p.m. May 22 in the NRC Clubhouse, 1834 Valencia Drive, Fullerton.

Art Club members will display their work and the work of children artists will also be shown. An hour-long sound film on the making of the movie "Lust for Life" will be presented and refreshments served.

Some of the exhibited material will be donated for door prize drawings.

There is a $1 donation charge for adults with children admitted free.



POWER IN A SMALL PACKAGE—Norair Division's Don Skilling, an acoustics specialist involved in long line of Norair sound generating developments, stands beside Northrop Mark VIII unit installed in North American Aviation, Inc. reverberating test chamber. Mark VIII can produce 400,000 acoustic watts, is most powerful system of its type known to free world, and is currently in use on Apollo lunar orbital spacecraft tests.

Biggest Noisemaker In World Perfected

Northrop Norair, world leader in the development of sound generating systems, has perfected the most powerful acoustic generator known to the free world. Latest in a series of generators produced at Norair, the Noraircoustic Generator Mark VIII, is capable of developing 400,000 acoustic watts or six times as many as the next most powerful system known. It produces sound pressures which are more than a million times greater than normal office levels.

Mark VIII is currently in test use at North American Aviation, Inc., Los Angeles Division, on the Apollo program.

Apollo is the manned lunar orbital spacecraft which will conduct moon explorations. It will be launched by the Saturn V booster.

Scientists are currently conducting extensive tests to determine if these potentially damaging noise levels will adversely affect critical spacecraft systems or their operating personnel. Fatigue properties of structures, components and materials are being laboratory tested in advance to discover and minimize potential failures prior to launch.

WHAT'S WATT

The term acoustic watts may be misleading to some.

Here is an example of the power involved:

An ordinary home hi-fi set played sufficiently loud to warrant neighbor complaints would generate approximately one acoustic watt.

Random noise levels produced by the Mark VIII simulate the sound environment encountered under actual rocket launch conditions. Discrete frequency sound energy (tones as opposed to random noise) can also be produced by Mark VIII to determine the precise level at which test subjects undergo damage.

Northrop is recognized as a world leader in the field of developing and manufacturing acoustic generators for its own test facilities as well as those of outside users.

Initial work in this field dates back to 1955 when Norair began developments for use in such missile programs as the Snark as well as all-around general laboratory use.

Norair's Mark I system was employed in very early development stages on the T-38 supersonic trainer program. In succession came the Mark II and Mark III and finally the Mark IV which is still in use at Norair. The Northrop Mark V was turned out for such users as Boeing, Lockheed and NASA who continue to utilize the system. The Mark V was a development step leading to the Mark VII, two of which were delivered to North American as the Mark VIII assembly.

Norair operates its own progressive wave and reverberation test chambers for random sound source development.

Development and actual production of the world-famed Northrop sound sources has centered in the Norair Environmental Laboratory, a part of the Engineering Test Laboratories group headed by R. B. Jackman, chief.

Developmental work has found Don Skilling, Paul Finwall, Don Burke and V. L. Cole, supervisor, in key roles. Harold Spivey, an acoustic facility technician, has handled special assignments along with various functions of Engineering Test Laboratories where components were turned out.

RECRUITERS DUE

Leaves Offered Peace Corpsmen

A 25-month leave of absence will be granted successful applicants for the Peace Corps, it was announced this week by Industrial Relations. In response to a request by Peace Corps Director Sargent Shriver, Northrop will cooperate with the Corps in an in-plant recruiting program later this month.

Employees interested in joining the Peace Corps should fill out the form below and send it to their appropriate Division Industrial Relations office before May 12. A schedule of interviews will be arranged with Peace Corps representatives and each applicant will be contacted individually as to day and time.

Leaves of absence will be granted under the same provisions of the policy presently in effect for persons elected to public office, an Industrial Relations spokesman said.

That policy, which is included in the manual "Working With Northrop," provides for leaves of absence without pay. During such leaves, seniority is retained but not accumulated.

Although Peace Corps tours are for 24 months, Northrop will allow an extra month for returning volunteers to get settled.

As for the Corps itself, it is enjoying immeasurable success after three years of establishing itself as a significant tool for motivating self-help in emerging nations.

More than 12,000 volunteers have served or are serving in Asia, Africa and Latin America.

Since the announcement last month by Northrop President and Chairman Thomas V. Jones that the Corporation would "take every practical step in support of the fine work which the Peace Corps is doing," the NORTHROP NEWS has collected answers from the Peace Corps to the most frequently asked questions about Peace Corps service.

WHO MAY APPLY? Any United States citizen over 18 years, provided he has no dependent children under 18. Married couples without dependents under 18 may apply if both can serve. There is no upper age limit, and Northrop retirees may apply.

IS A COLLEGE DEGREE REQUIRED? No. Neither is a high school diploma.

WHAT SKILLS ARE REQUIRED? Developing nations are in need of practical instruction in mechanical, manual and general administrative skills. An average housewife's skills in clerical work, sewing, food preparation, and health practices are important also.

IS THERE ANY SPECIAL TRAINING REQUIRED? If accepted by the Corps, an applicant will be invited to a three to four month training course in the United States. Courses include language training, studies about nations abroad and a refresher class in American history.

WHAT ABOUT LIVING CONDITIONS? These, of course, vary with the area of assignment, but the Peace Corps states that the 10,000 volunteers now in 46 countries live in moderate, but adequate conditions. A Peace Corps doctor is a full-time staff member.

IS THERE ANY PAY OR ALLOWANCES? All expenses—including travel, food, clothing, medical care, and incidentals—are paid by the Corps. Upon completion of two years service, a volunteer will receive $1800, which is taxable, and a married couple will receive $3600.

I am interested in being scheduled for an interview with Peace Corps representatives.

Name..... Employee No.....

Dept. No. and Location..... Shift.....

Plant or Bldg. No.....

Home Address.....

(Street) (City)

(Please return to Industrial Relations department.)

Symposium Tabs Miller, DiJulio

Ross Miller, Nortronics vice president and manager of the Technical department, will serve as technical sessions director for the 23rd annual Space Electronics Symposium, scheduled for May 25 through May 27 at the International Hotel, Los Angeles.

Mr. Miller is responsible for the symposium's entire technical program. The meeting is sponsored by the Aerospace Electrical Society and American Astronautical Society.

Roger M. DiJulio of Nortronics is serving as assistant technical sessions director.

Ballroom Dancing Lessons Offered

A rare opportunity for all Northrop employees, their friends and families to learn the latest in social or ballroom dancing is being offered through NRC sponsorship.

Special 10-week courses, with one class per week each, open tomorrow night at NRC Clubhouse, Hawthorne. The cost is a nominal $5 per person for each dance studied.

Sessions at 7:30 p.m. will feature beginning rhumba; at 8:45 p.m., advanced cha cha; and at 10 p.m., beginning foxtrot.

DORSEY, SINATRA JR. BOOKED FOR 'NORTHROPLAND' NIGHT

Disneyland will become "Northropland" between 7:30 p.m. and 12:30 a.m., Friday, May 28.

That's when all facilities at the world-famed funland will be reserved exclusively for Northrop families for a very special price through the joint sponsorship of Northrop Recreation Clubs.

BELTING OUT — song like his father before him, Frank Sinatra jr. sings before Disneyland crowd. Frank, Pied Pipers and Tommy Dorsey orchestra will entertain for Northrop Night, May 28.

The cost is $3.75 per person.

Before 7:30 p.m. on the eve of the long Memorial Day holiday period, the general public will be cleared from Disneyland. All facilities then will be available until closing time to Northrop employees without further charge, except for concessions and rifle and pistol ranges.

Free entertainment includes dancing to the Tommy Dorsey orchestra and admission to the famed Tiki Room. Frank Sinatra, jr. and the Pied Pipers will also perform.

Tickets are currently on sale through all Northrop Personnel Activities offices and other ticket outlets.

Last year 9500 members of the Northrop "family" took part. This year larger crowds are anticipated, so early purchase of available tickets is being advised by sponsoring NRC groups.

Eight Northrop Scholarships Go to Merit Exam Winners

National Merit Scholarship Corporation last Wednesday announced that there were eight winners of the Northrop Corporation Merit Scholarship for 1965. This concluded the 10th annual merit scholarship competition with over 1900 outstanding students—largest number in the history of the nationwide program — named winners of four-year awards to the colleges of their choice.

The Northrop winners, seven young men and one young lady, all high school seniors this year were selected on the basis of competitive exams given in March and December of last year.

As children of Northrop employees they represent the Norair and Ventura Divisions, Nortronics east and west coast facilities, and Page Communications Engineers, Inc.

This year's allocation of scholarships is the largest since Northrop Corporation started participating in the program in 1959. Previously the largest number awarded in one year was two. There are presently seven Northrop scholars attending schools throughout the country.

The current group of Northrop merit scholars are:

—Lance Bertelsen, son of Niels Bertelsen of Nortronics (Palos Verdes) and a student at Hawthorne High School. Lance plans to major in English at Dartmouth College and plans a career as a lawyer.

—Douglas Alan Cook, son of Bert M. Cook of Norair and a student at North High School, Torrance. Douglas intends to enroll at Stanford University to study civil engineering.

—Alice Loraine Cordell, daughter of Ventura Division's Edward L. Cordell and a student at Oxnard High School. Alice is undecided as to a career but wants to major in math or science at Antioch College.

—Robert William Dedon, son of William S. Dedon of Ventura Division and a student at Palisades High School, Los Angeles. Bob intends to major in business administration at UCLA.

—Paul Mills Glassco, son of Donald E. G. Glassco of Norair and a student at Temple City High School. Paul plans to enroll at Harvey Mudd College to major in mathematics and would like a career in research mathematics.

—Nicholas David Humez, son of David E. Humez of Nortronics' Precision Products Division at Norwood, Massachusetts, and a student at Lexington (Mass.) Senior High School. He has his sights on Harvard University where he wants to study French literature.

—Robert Patrick McMahon, son of John H. McMahon of Page Communications and a student at Bishop Denis J. O'Connell High School, Falls Church, Virginia. Bob intends to major in mathematics at the University of Virginia.

—Gary James Turnbull, son of Charles R. Turnbull of Nortronics (Anaheim) and a student at Valencia High School, Placentia. Gary plans to major in International Relations at Michigan State University, with a Foreign Service career in mind.

The National Merit Scholarships sponsored annually by Northrop are part of an extensive Aid to Higher Education program, which also includes restricted and unrestricted grants to various U.S. universities.

NEW EYES

Huge stack of eyeglass frames, cases, etc. are packaged for shipment to New Eyes for the Needy, Inc., a charitable group that makes them available to the needy around the world. In-plant contributions, plus obsolete safety glasses, added up to 1500 pairs for this effort. Maurice Young (left) and John Musulin prepare to box shipment.

Lauren Named Ad Manager

Ward Lauren has been named Northrop's advertising manager, it has been announced by Norman Warren, Corporate director of Public Relations and Advertising.

A public relations and advertising writer in the Los Angeles area for the past 15 years, Mr. Lauren has been with Northrop for two and one-half years. He was with the company briefly in 1952, followed by 10 years in Public Relations and Advertising at North American Aviation, Inc.

Doyle Dane Bernbach is Northrop's advertising agency.

LONG WEEKEND DUE IN MAY

First "long weekend" holiday period of the new year is just around the corner for all Northrop employees.

Memorial Day this year falls on Sunday, May 30. Thus, Northrop facilities will suspend operations Monday, May 31, giving employees a three-day holiday period.

Scenic Flights To Raise Funds For Boy Scouts

Scenic flights over Los Angeles aboard propjet airliners are being offered all Northrop employees May 15 and 22 in the second annual "Operation Scoutflight."

The name stems from the $5 per person fee which goes to support Los Angeles Boy Scout programs.

The 20-minute flight, departing each day at 3, 3:30 and 4 p.m., will carry passengers over Catalina Island, Long Beach, San Fernando Valley and downtown Los Angeles. Special arrangements will be made for camera fans.

Participants will also see the Northrop F-5 firepower film and the North American B-70 first flight film while waiting departures.

Departures will be from Los Angeles International Airport aboard Pacific Southwest Airlines Electra-Jets.

Tickets are now available through Personnel Activities office at Norair, ext. 2486.

DISASTER AID

Shortly after major disasters the United States Treasury moves swiftly to offer cashing facilities and replacement of bonds lost by fire, flood or other catastrophe.

Arata Given AIAA Nod For L.A. Post

W. H. Arata of the Corporate Marketing staff has been nominated chairman of the Los Angeles section of American Institute of Aeronautics and Astronautics for 1965-66.

Mr. Arata is currently vice chairman—Meetings.

He heads a full slate of candidates proposed last month by the Nominating committee, which includes: J. E. Froehlich of Space General Corporation, chairman; P. A. Colman of Lockheed Aircraft Corporation, H. D. Moran of Batelle Memorial Institute, E. J. Specht of General Electric Corporation, and M. A. Sulking of North American Aviation.

William J. Oakes, Northrop Space Laboratories, is secretary of the Los Angeles section.

In other AIAA news, representatives of Norair and Nortronics divisions and NSL presented key papers last month.

Norair's Sid Thurston, chief of Advanced Underwater Systems, and R. D. Jones, a former Nortronics (Anaheim) senior engineer, described in the Journal of Aircraft a soluble coating which can be applied to the surface of an underwater body to reduce friction drag.

At a conference on Support for Manned Flight at Dayton, Ohio, NSL's Dr. E. O. A. Naumann, assistant manager of the Systems department, presented a paper on lunar surface vehicles. Co-authors of the paper were Eugene Smith and Bill Sponsler, both members of the Advanced Systems section at NSL.

The three-day conference, sponsored by AIAA, was April 21-23.

AIR SPACE FILLING UP FAST FOR NRC EUROPEAN TOUR

Although the departure date is still five months away, more than one-half of the available space on the European tour sponsored jointly by NRC Travel Clubs is taken.

The tour dates are October 20 through November 7. Transportation to Europe will be via Air France jet over the Polar route.

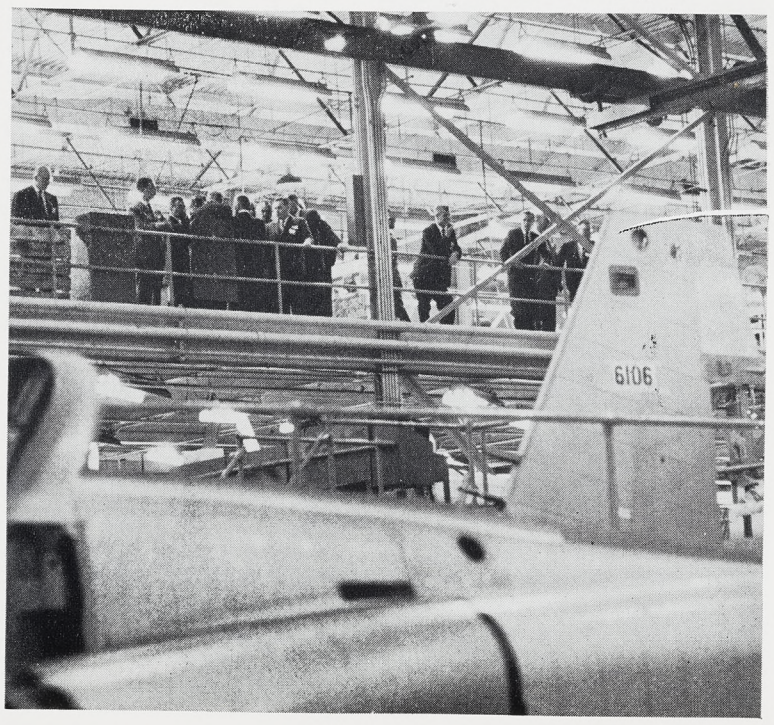
On May 19 (8 p.m.) those signed up, plus interested parties, will gather at the NRC Clubhouse, Hawthorne, for a briefing and general information session.

There are three possibilities open to the traveler. First, round trip air fare only, which is $315. Once in Europe three options are available: a tour through England, Switzerland, Holland, Austria, Belgium, Italy, Germany and France; and, a tour touching England, Sweden, Holland, Denmark, Germany, France and Norway.

Land tours for the two above are an additional $298. Third option is a visit to England, Portugal, Spain and France, with the cost an additional $420.

All Northrop Personnel Activities offices are accepting reservations, with a deadline for the trip of August 1.

One Group of NATO Officers Checks in at Palos Verdes (left), While Later Group Sees F-5 Assembled at Hawthorne (right)



STANDARDS: Capabilities Increase With Demands

(Continued from page 2)

even manufacturers to walk away in awe of their own equipment's performance when linked up to other equipment used by the Anaheim group.

Mr. Vickers at Northrop Ventura pointed that the job is made even more complex by the fact that Metrology technicians, in calibrating test equipment, must use a criteria four to ten times more accurate than the test equipment being calibrated.

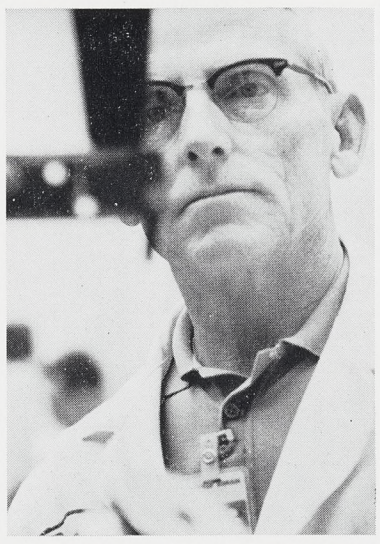
"Everytime we put one of our calibration decals on an instrument we are guaranteeing that the instrument will perform to operating requirements. We had better be right," he added.

While the current effort toward interdivisional cooperation is directly related to backing up those "certified" decals, its implementation is having a much broader effect on the labs.

Their organization has been standardized into four major functions.

Metrology Engineering provides technical support to both the calibration and standards labs and provides advisory support to other technical departments in each division.

Calibration and Maintenance is responsible for initial "tuning up" of instruments and maintenance throughout the life of the piece.



This is instrument's-eye view of metrologist. In this case, it's Norair's Jim Norton peering at arm of scale.

Administration and Equipment Control keeps a record of each piece of equipment calibrated by the lab and establishes a recall schedule for regular maintenance.

It is a never-ending job of establishing standards, implementing them and maintaining the equipment which uses them. The job started nearly 3000 years before the birth of Christ when an Egyptian engineer, working on the great pyramid of Gizeh, stretched out his arm, pointed to the area between his elbow and tip of his fingers, and said in effect:

"This is a cubit. You will use this measurement to make all the pyramid's stones uniform."

That's all it took to establish the first reference standard.

The tomb, which is 481 feet high and 756 feet on each side has been found accurate to 0.6 inch.

It was an amazing engineering feat, but it's a long way from 0.0000006.

Milo Thomas of Ventura Division tunes in to National Bureau of Standards radio station WWV, which broadcasts a continuous signal from Boulder, Colorado, to provide metrologists a standard for frequency.

Ice Show Special Night a Sellout

While all tickets to the "Northrop Night at the Ice Capades" tonight have been sold, employees may still attend subsequent performances at reduced rates, thanks to Northrop Recreation Club.

Personnel Activities offices and regular ticket outlets throughout Northrop have special discount coupons which may be exchanged for regular tickets at Ice Capades sales offices. They are good for $1 per ticket discount.

NORTHROP NEWS

Vol. 23 No. 6

A Northrop Corporation Publication
9744 Wilshire Blvd., Beverly Hills, Calif.
Published every other Wednesday

Permission to publish material with credit to Northrop News will be granted.
Telephone: CR 4-8061, BR 2-8581.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:20 a.m. — 4:05 p.m.

Vermont & El Segundo Blvd., Gardena. Joanne L. Irwin, ext. 4075 or 4076, 321-6391.

7:30 a.m. — 4:15 p.m.

La Brea Ave. & Hyde Park Blvd., Inglewood. Colleen Conner, ext. 1972. 3

8 a.m. — 4:45 p.m.

Ventura Fwy. & Topanga Cyn. Blvd., Canoga Pk. John Dennis, ext. 1708, 1969, 340-8274. 5

Bellflower Blvd. Exit Ramp, San Diego Fwy., Long Beach. Don Beastrom, ext. 2264, 425-9781. 5

Balboa or San Diego Fwy. & San Fernando Blvd., Granada Hills. Francis A. Morse, ext. 4221, EM 3-2933. 5

Tampa & Winnetka, Woodland Hills. Olive B. Daley, ext. 1412, 340-3765. 5

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Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Motorcycle, 1962 Norton, 750 cc, 1963 eng., $450. No. Hollywood, PO 3-0386. A

Stove, 1963 GE automatic, elec., $100. Redondo Bch., 378-1038. A

Refrigerator, International Harvester, 9 cu. ft., freezer across top, $75. Rolling Hills, FR 7-1094. A

Guitar, 6-string, $45. Manhattan Bch., FR 2-3860. A

MG Midget, 1962 rds., r/h, 11,000 act. miles, hard top, many other extras, $1195. Venice, EX 6-3594. A

Chevrolet Malibu S/S, 1965, big eng., 4-spd., r/h, tach, plus many extras, low mileage, $2800. Hawthorne, 676-5012. A

Photo Enlarger for 35mm, $25. Compton, NE 8-2222. A

Renault Dauphine, 1957, rebuilt eng., good for spare parts, $50. Torrance, 326-6539. A

Utility Bed for pickup truck w/fenders, $10. Torrance, 320-2827. A

Bowling Ball, Black Beauty Brunswick, 16 lb., man's r-h, $6. Norwalk, 864-7673. A

Tires, set, Allstate Guardsman, 600-15 w/w, $60. Compton, 635-3294. A

TV, Westinghouse portable w/stand, 9-mos.-old, $100. Inglewood, 677-4540. A

Dream Kitchen, child's Lux, 3 Barbie dolls, 1 Midge doll, blue case, 18 outfits, 18 new Nancy Drew books, $20. Thousand Oaks, 498-2867. A

Signal Generator, Eico 320, $19. Playa del Rey, EX 1-4860. A

Rambler American, 1959 2-dr., new paint & int., o/hauled auto. trans., $450. San Pedro, TE 3-9455. A

Encyclopedia Americana, 32 volumes including 2-vol. dictionary, plus yearbooks to date, 1943 edition, $20. Torrance, DA 4-0341. A

Hide-A-Bed, Simmons, T-cushion, white Naugahyde, $100. Manhattan Bch., FR 4-8036. A

Bed, dble., boxspring, mattress & metal frame, $45. Fullerton, 714-529-4788. A

Camera Kit, Polaroid 900, color, $70. La Mirada, 941-8390. A

Piano, baby grand, walnut, $800. Anaheim, 828-2440. A

Dodge, 1957, 4-dr. h/top, p/b, r/h, new eng. & trans., 4 chrome reversible rims, $450. L.A. 44, 755-9071. A

Shoes, brown lustre-calf, 9S, high heel, open back, closed toe, $8.50. Downey, 923-8532. A

Buick, 1954 super sedan, orig. owner, $300. Inglewood, OR 2-1809. A

VW camper, 1962, w/butane stove, ice box, $1200. Hawthorne, 675-9068. A

Lawnmower, Craftsman Delux, 18", $20. Buena Park, TA 8-0746. A

Boat, outboard, 15', Carter Craft, convertible top, fully equipped including water skis, 70 hp Mercury eng. w/elec. starter, trailer w/winch, $995. Lakewood, TO 7-0832. A

Utility Shed, wooden, 4'x8'x8', $50. Buena Park, 527-1201. A

Chevrolet Impala, 1962, r/h, good tires, 4-dr. h/top, $1545. Mar Vista, EX 7-4732. A

Galaxie 500XL, 1964, b/seats, air cond., p/s, p/b, plus many extras, 13,000 miles, $2750. Inglewood, 754-8261. A

Sailboat, 25' yawl, 22½ hp Grey-Marine auxiliary, SS rigging & dinghy, $2500. Long Bch, 438-5579. A

Pontiac Bonneville, 1961, auto. trans., p/b, p/s, $1650. Inglewood, OR 3-1913. A

Corvair Monza, 1962, 4-dr., b/seats, r/h, 102 hp eng., 1 owner, $1095. Alhambra, AT 4-5698. A

Triumph conv. Herald, 1961, 29,000 miles, w/w, r/h, $500. Whittier, 696-5082. A

Hair Dryer, lge., for professional use, all chrome, on stand w/casters, 4 position switch, $25. Torrance, FR 5-4047. A

Factory Service instruction manual for Triumph TR 2 & 3, $10. Rolling Hills Est., 375-7038. A

Oldsmobile 88, 1959, 4-dr. sedan, 1 owner, $650. Torrance, 325-1243. A

House Trailer, Spartan, 35', 1952, tub & shower, natural gas or butane heater, washer & hot water heater, dble. bed, $995. Redondo Bch., FR 6-6415. A

Mercury Comet, 1963, 2-dr., custom model, take over $54 mo. payments, bal. $1700. Inglewood, 672-8830. A

VW sedan, 1959, new w/w tires, Becker radio, elec. clock, orig. owner, $875. Torrance, 323-0180. A

Bing Surfboard, 9 ft. 7 ins. long, 4 stringers, $90. Encino, 987-2047. A

Accordion, 120-bass, $125. Gardena, DA 4-0158. A

Ford F100 pickup, V8, 1960, heater, 6-ply truck tires, w/Cab-O-Tel camper, $1250. Torrance, FR 5-8474. A

For Sale

Cad. Coupe De Ville, 1958, low miles, all power, premium tires, new air cond., perfect mechanically, $1095. L.A. 34, GR 3-9897. A

Chrome Rims, set, 14", w/baby moons, 2 cheater slicks & tires, fits Pontiac or Oldsmobile, $100. Inglewood, OS 3-5568. A

Cadillac, 1941, 4-dr. sedan, 1948 eng. & Hydromatic, $100. Torrance, DA 3-2273. A

Mobile Home, 1964 Universal, 12'x55', 1-bdrm., furn., 8' expansion, porch & awning, $8500 or $1500 down & take over pymts. Anaheim, 772-5754. A

Volkswagen, 1964, 1500-S Variant, Safari biege, shoulder harness, 66 hp, $2195. Rolling Hills Ests., 377-8155. A

Acreage, 5-acre cabin sites near Willow Springs, $1750. Rolling Hills, 325-3057. A

Power Mower, Reo Holiday, reel-type, $25. Hawthorne, OS 9-3716. A

VW Camper, 1963, complete w/tent & stove, 1500 eng., 20,000 miles, $1750. Inglewood, OR 4-1654. A

Refrigerator, Westinghouse, $50. Hawthorne, 675-5654. A

Chassis Camper, 10½' on 1958 Chevrolet, fully equipped, duals, $2195. Lawndale, 370-2149. A

VW, 1964, r/h, 4-spd., $400 & assume $1200 balance. El Segundo, 322-4027. A

Washer & dryer, Frigidaire Imperial Deluxe, automatic, 1964 model, used less than 6 mos., $295. Santa Monica, 393-7464. A

DeSoto, 1953, 4-dr., new tires, starter, battery, coil, $200. Hawthorne, 676-3138. A

Home, 3-bdrm., pool, 2-bath, serv. porch, 2-car gar., 15x31 covered patio, landscaped, $2000 dn., $24,750. Whittier, 943-2600. A

Magazine, Model Railroader, 49 issues, May 1943 - Apri. 1952 & 10 other books, $15. Los Alamitos, GE 1-4233. A

T-Bird, 1955, stick, r/h, hard & soft top, new eng. & trans., $1350. Hollywood. 656-3475. A

Corvair, 1961 station wagon, w/w tires, r/h, auto. trans., $875. Torrance, FR 8-0895. A

House, 3-bdrm., 2-bath, family rm., landscaped, $1800, 6¼% first, $24,400. Thousand Oaks, 495-5092. A

Chevrolet, 1955, stick, r/h, new paint, $400. Redondo Bch., 372-9323. A

Drill motor, ½" HD Sioux w/stand & several drills, $55. L.A., PL 4-0817. A

Tool Box, 18" Gerstner tool & die makers tools, 1964 Starrett, $150. Inglewood, PL 4-7859. A

Bicycle, boy's 10-spd. Derailleur, $25. Inglewood, PL 5-4497. A

TV, 1963 23" Zenith, walnut cabinet w/remote controls, $100. Hawthorne, OS 5-7938.

Chevy II, 1962, 2-dr., factory air cond., r/h, low mileage, $1495. Sherman Oaks, ST 8-9709. A

Pups, AKC miniature Dachshund, 7-wks.-old, $50 females, $55 males. Torrance, FR 5-1660. A

Typewriter, Underwood standard, $65. Hawthorne, OS 6-1085. A

Falcon, 1960, 4-dr. sed., auto. trans., r/h, w/w, tires, $575. Torrance, DA 5-3724. A

Dining Room set, cherry wood, 6 chairs, glassdoor hutch, 2 extra leaves, pads, $90. L.A. 64, GR 3-3168. A

Shotgun, Remington 16 ga. auto., model 11, recoil pad, case, Cutts comp., adj. tube w/2 tubes, $100. L.A. 5, 384-4017. A

Gages, micrometer set, Starrett & Lufkin, various sizes & numbers, $40. Inglewood, OS 6-0049. A

Ham equip., Heath DX-35 75-watt, phone - CW transmitter w/Heath VFO, Astatic JT-30 microphone, $40. Hawthorne, 675-5802. A

Drapes, tan, Don Loper material, 80" length for 25' window span, includes valance, $65. Torrance, FR 5-2127. A

Chevrolet sedan, 1956, Powerglide, $400. Long Bch., GA 3-1363. A

Trailer, utility-type, 4' x 6', lights, removable top, good tires, $65. Hawthorne, OS 9-3978. A

Drums, complete set, Ludwig, $350. Moorpark, 805-529-1285. A

Refrigerator, Hot Point, cross-top freezer, 2-door, $99. Inglewood, 675-0788. A

House, 2-bdrm., stucco, R3 lot, lge. enc. yard, gar., 10% down, no finance charges, $13,500. San Pedro, TE 3-2512. A

Camera, Polaroid, elec. eye, model J-66, leather case, 2-yrs.-old, $75. Hawthorne, OS 9-6334. A

Ford Country Sedan, 9-pass., 1960, low mileage, 1 owner, $950. Inglewood, 755-1071. A

Television, Magnavox, 23", light walnut cabinet, $75. Gardena, 757-2383. A

Lincoln, 1954, auto. trans., p/s, elec. windows, r/h, $50. San Pedro, 547-3490. A

MGA 1600, 1960, r/h, h/top, good tires, $1025. Box 601. A

Encyclopaedia Britannica, deluxe edition, $15 & take over payments of $13 mo. Palos Verdes Est. FR 5-5097. A

Mobile Home, 12x57', 1962, Riviera w/porch, alum. awnings, screen room. $5300. Long Bch., 428-1789. A

Plymouth Belvedere, 1955, 2-dr., sedan, r/h, auto. trans., 1 owner, $150. Torrance, FA 8-6839. A

Boat, 14' Morgancraft, glassed-plywood, 12 hp motor, remote controls, trailer, $300. Torrance, 834-2845. A

Adding Machine, Odhner, automatic, $80. Sherman Oaks, 789-4635. A

For Sale

Swift, 1947, 125 hp, hvy. case, eng., 1315 hrs. on airframe, 1010 hrs. on eng., $2500. L.A., 398-2104. A

Trundle Beds, hard rock maple, box springs & mattresses, $80. Torrance, DA 9-6174. A

Ice Box, 18"x24"x48", $10. Torrance, FA 8-3306. A

Wanted to Buy

Motorcycle, scrambler-type, 150 cc & up. Lomita, 325-0341. B

Range & refrigerator, apt.-size, elec., low price. San Pedro, TE 1-6462. B

Sewing Machine, power, suitable for upholstery & canvas. Redondo, FR 4-2915. B

For Trade

Chevrolet pickup, 1956, auto. trans., trade for small foreign or sports car. Torrance, FA 8-7076. C

FREE (To Be Given Away)

Wood Fence, 40 feet, unpainted, about 10 yrs. old, must be cut in order to be taken away. Inglewood, 672-5578. D

Kittens, half Siamese. Anaheim, 714-776-8785.

Tropical Fish, fancy guppies, sword tails, & platies. Torrance, 320-5120. D

Laundry Tub & stand. L.A. 43, 295-9997. D

Rentals Offered

Unit, owner's, 1800 sq. ft., 3-bdrm., 3-bath, family rm., fireplace, pvt. deck & 3-car subterranean gar. w/storage, built-in kitchen, soft water system, adults, $275 lease. Redondo Bch., 373-1143, 673-3298. E

Studio Apt., unf., owner's unit, pvt. patio, closed gar., 3-bdrm., $165 mo. 1-bdrm, $95 mo., Torrance, FR 5-0867. E

House, 2-bdrm., 1½ bath, dishwasher, disp., gar., utilities pd., in No. Redondo, $150 mo. Portuguese Bend, FR 7-1734. E

House, 3-bdrm., newly decorated, fenced, $145 mo. Gardena, FR 5-7658. E

Studio Duplex, 2-bdrm., 1½ bath, trash & water paid, $125 mo. Redondo Bch., 374-0251. E

Duplex, 1 story, on bus line, children & pets o.k., range & refrigerator avail., fenced yd., $60. unfurn., $70 furn. Lawndale, 675-9389.

House, 2-bdrm., furn., lge. fenced yard, $135 mo. Huntington Pk., 589-9503. E

Apt., 2-bdrm., furn., pool, $135. Torrance, 323-1946. E

Cabin, Green Valley Lake, $35 weekend, $65 week. Torrance, 320-2002. E

Apt., owner's duplex, 4-bdrm., 1-yr.-old, 1¾ bath, lge. backyard, 2 blks. to school, walk to Centinela Pk., utilities pd., lease, $220 mo. Inglewood, 673-4274. E

Apt., 1-bdrm., deluxe, built-ins, pool, $90. mo. Redondo Bch., 376-2117. E

Apt., 1-bdrm., 1 block from Norair, furn., water & trash paid, $100 mo. Hawthorne, 675-6291. E

Apt., single, small, sleeps 3 adults or 2 adults & 2 children, completely furn., avail. thru Sept. 1, $75 wk. Catalina Island, Avalon 443. E

House, 2-bdrm., fenced yd., trash & water pd., children ok, no pets, $105. Lawndale, 371-6775. E

Duplex, 2-bdrm., nice view, yard, gar., $125. Manhattan Bch., 372-7143. E

APTS, 1-bdrm. & 2-bdrm., unfurn., deluxe, w/w carpets, closed garage, $100-$145 mo. Torrance, 371-5037. E

Rentals Wanted

Cabin, Crestline or Arrowhead area, close to lake, to sleep 5 adults & 3 children, from August 8 to 16, must have cooking facilities. Lawndale, 370-2752, Inglewood, 755-2986. F

Lost

Watch, ladies tiny gold Longines, reward, Norair Plant Protection, ext. 1972 or Gardena, DA 9-3593. J

Disneyland Tickets, 5, in Plant I parking lot Nos. 0563-0564-0565-0566. Please return to Personnel Activities. Reward, 1 free admission to Disneyland May 28. Numbers will be checked at ticket window. Torrance, 325-0496. J

Personals

Will do your typing in my home—term papers, theses, etc. Inglewood, 755-2436. L

Want to share home. Room w/pvt. bath for single women, use of full house & yard, must like pets, near Disneyland. Anaheim, KE 5-2008. L

I would like to thank all of you for your kindness, & for sharing my sorrow upon my husband's death. Sarah M. Martinez.

Your many expressions of sympathy & offers of assistance during the recent loss of my husband, Walter, were gratefully received. My daughter, Jane and I will long remember this, & find comfort in the days to come. Marjorie Maschke.

I wish to thank all my friends at Northrop for their kind consideration & thoughtfulness expressed during my illness & convalescence.—CHARLES BRADFORD, Editor.

For Sale or Trade

Ford country sedan, 1959, $650 or trade for motorcycle of equal value. Paramount, 630-1997. M

Home, 3-bdrm., 2 baths, air conditioned, swimming pool, Palm Springs, Racquet Club Estates, $25,000 or will trade for property in Los Angeles or Orange Counties. Torrance, DA 4-8189. M

Reducing Table, Stauffer, leg & hand bar, $150 or trade for stereo or hi fi radio or colored TV. Hawthorne. 675-6020.

Display System By Northrop to Plot Space Shots

All future space missions will be displayed for real - time analysis on a large screen, multi-color system now being installed by Nortronics Division at NASA's Goddard Spaceflight Center in Greenbelt, Maryland. Nortronics is working on the system under contract to International Business Machine's Data Systems Division, Kingston, New York.

The dynamic projection system, which is expected to be operational for analysis of the Gemini/Titan IV manned mission in early June, will pilot spacecraft movement from launch through orbit and reentry, NASA announced last week.

Mr. Chiles

Six Nortronics Vigicon projectors will be used. A reference projector with prepared background slides, as well as plotting units, are included in the system.

The unit at Goddard will be similar to one recently installed at Cape Kennedy in the Air Force Eastern Test Range Control Center, according to Ross Chiles, chief of Data Display Systems at Palos Verdes.

The display system at Cape Kennedy, operational for the first time in March for Gemini III, is for missile and satellite trajectory display.

Vigicon display systems have grown out of 17 years work at Nortronics on acquisition, transmission, processing and presentation of data.

"Realizing that displays had become a discrete technology," Mr. Chiles said, "Nortronics established a special group in 1960 to serve the increasing demand for control center display equipment."

Since that time eight major display systems contracts have been awarded the Division.

SENIOR JUNIOR ACHIEVERS

BEHIND THE ACHIEVERS—Doug Finch receives pin for outstanding work with Northrop Ventura-sponsored junior achievement group, while Doug Sessions and Dick Davis wait their turn. Presenting pins and certificates last week was H. E. Riggins, vice president—Administration at Ventura Division (see story on page 1).

NOLAN: A New Title For 25-Year Veteran

(Continued from page 1)

and general manager of Northrop's Norair Division for six years during which time the T-38 and F-5 airplane programs were built up, meeting all goals of performance, schedule, and cost. Under his leadership, the Division gained broad recognition for its many achievements in the management of technical and production activities in the aerospace field. In mid-1964, he was assigned broader responsibilities at corporate headquarters.

"Since coming into the corporate headquarters in mid-1964, Mr. Nolan has made an invaluable contribution to the top management of the company," Mr. Jones said in announcing Mr. Nolan's advancement to senior vice president. "As Corporate vice president, Manufacturing and Administration, he has brought into the corporate office his long experience in the aircraft and aerospace industry.

"Mr. Nolan will continue to have responsibility for establishing and administering corporate policies and practices in the areas of manufacturing, materiel, facilities, organization, industrial relations and general administration. With his new title, he will have broader management responsibilities in these areas."

"Mr. Nolan's new title is to take effect immediately."

Mr. Nolan's entire career has been spent in the aircraft and aerospace industry. From 1934 to 1939 he was associated with the Northrop Division of Douglas Aircraft in El Segundo, California. When the present Northrop Corporation (originally Northrop Aircraft, Inc.) was founded he became supervisor of tooling. He advanced steadily within the company, becoming manager of production engineering, assistant factory manager, and director of service.

In 1951, Mr. Nolan established the company's facility at Anaheim, California, and for five years was in charge of its activities in the design and manufacture of ground weapons fire control systems, opto-mechanical devices, electrical and electronic equipment, precision weapon system components, and major weapon subsystems.

He is a native of Southern California.

DRAWING MANUAL GETS REVISION TREATMENT

Design personnel are slated to begin receiving initial copies of a completely revised Northrop Ventura Drawing Practices Manual around July 1.

The 200-page manual is currently more than 65 percent complete following a six-month revision process that represents the first "re-do" of the entire manual since 1957.

Ventura Division's Configuration Management team of the Technical Administration group, headed by Walker G. Bennett, is doing the revision. Among key participants have been John Luckett, Bob Reese, Mel Rich and Gerry Webster.

As a prime communication link between product and design engineers and the design verification functions, the new manual assumes added importance in the light of changing product lines and new technological advances in design concepts, according to Mr. Bennett.

The compact, new manual will help eliminate redundancy in engineering design data and is expected to result in substantial savings in man-hours within the next year, Mr. Bennett said.

One unique feature of the new manual is color coding (for prompt visual location) of data on product lines varying from Department of Defense Specification No. 70327.

ELITE CORPS CONVENES

Members of Northrop Ventura Fire Brigade are shown above with honored guests during special presentation affair. Men received helmets, certificates, manuals and congratulations after successfully completing seven-session fire prevention course.

NVRC SPORTS

Outdoorsmen Sample Utah Venison a la Pit

More than 100 members and guests of the Northrop Ventura Rod & Gun Club attended a western barbecue April 24. Each year the number of attendees increases, as more people are exposed to the tastiness of venison when prepared and cooked by the deep pit method, a club spokesman said.

It is reported that some people came back four times for seconds!

This money-raising banquet is held each year to allow some lucky members to go to Utah for an expense-paid deer hunting trip or to a local area for a free fishing trip.

The hunters must donate half of their game to the Club to provide the meat for the next event. This year's meat supply was supplied by Joe Woods and Ed Edwards.

* * *

GOLFERS TO TRY BURBANK COURSE

Northrop Ventura Golf Club members will trek to Burbank May 15 to do their own special brand of renovating the fairways and traps at DeBell Golf Course. In short, a regular monthly event. Deadline for entering is May 7.

Ray Bourland, M. A. Maurer and Ray Burdette won first with Ray Nickerson, Joe Cosgrove and Al Hammons garnering second respectively in "A," "B," and "C" flights of the April 17 tournament held at Ojai Country Club.

Pat Gosh won honors for the ladies. Paul Brown, Ray Bourland, Ned Garlock and Joe Cosgrove won golf balls for "closest to the pin."

* * *

BEGINNERS INVITED TO TENNIS LESSON

An unusual opportunity for beginning tennis "buffs" to receive free group lessons and enjoy the beautiful Las Posas Country Club has been announced by NRC Commissioner Bob Reese.

The sessions will begin at approximately 5:30 p.m. each Wednesday, starting today, and continue during the weeks ahead. No advance registration is needed to take part in the group instructions, Mr. Reese added.

Norair Selected By U.S. Navy For Condor Task

Northrop Corporation is one of two contractors selected by the U.S. Navy to perform the Project Definition phase of Condor, a short-range air-to-surface missile.

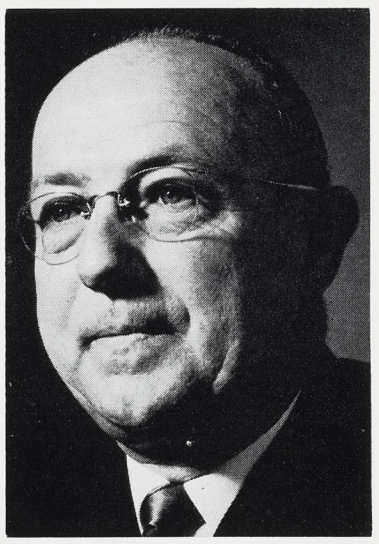
Work will be carried out at Northrop Norair under a firm fixed price contract in the amount of $675,000 representing initial funding.

Condor is planned to be rocket-powered and will have a high explosive warhead. It will use television guidance to provide carrier pilots with an earlier launch capability and improved accuracy of strikes. Condor is planned for use with the A-6A Intruder.

The Condor program is under the technical direction of Naval Ordnance Test Station (NOTS), China Lake, California.

D. D. Warner has been named Norair Division program manager.

PINNED



R. J. Kellner, Ventura Division proposals supervisor, this month received Northrop 10-year pin. An associate fellow of the AIAA, Mr. Kellner has more than 35 years of engineering and managerial experience. He is noted as a pioneer in much of the structural design still used in airframes.

TAX BENEFITS

Interest income from U.S. Savings Bonds need not be declared until bonds are cashed in—which can be postponed until years of retirement and lesser income, hence lower taxes.

CREDITORS

In several significant cases, courts have held that Savings Bonds registered in co-owner and beneficiary form, were not within the reach of creditors of the deceased owner, even though the estate was insolvent.

ADVANCE TICKETS FOR VALLEY DAYS NOW AVAILABLE

Bargain-rate tickets for three days of family fun during the Conejo Valley Days (June 10-13) are now available to Northrop Ventura personnel at the cafeteria.

These $9 (regular price $10.50) tickets are each good for: two admissions to the Valley Days Rodeo, two barbecue dinners, 10 carnival ride tickets, and two sheriff's star badges. In addition, the holder is eligible for a big cash drawing.

Bargain ducats will be available only for a brief period in advance of the actual celebration.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 7 | May 19, 1965

Gemini IV Set in June; Apollo Tested

NASA's program to put an American team on the moon was in the news this week on two fronts, both involving Northrop Ventura, which manufactures parachute landing systems for the Gemini and Apollo programs.

The Division's Management Club was briefed May 3 by Astronaut Charles Bassett on a four-day Gemini mission scheduled for early June. Pilot-astronauts for that mission, James A. McDivitt and Edward H. White, were fitted last month by Northrop Ventura for their personal parachute harnesses.

A major test in the Apollo program, which will pick up where Gemini leaves off with manned flights, was scheduled today at White Sands, New Mexico.

The fourth of six tests scheduled for the White Sands Missile Range, today's shot was intended to prove the emergency launch escape system. Three successful tests have been carried out at Cape Kennedy.

Astronaut Bassett, who could well be one of the Apollo pilots, climaxed a visit to Northrop's Newbury Park plant with his Management Club address.

He reported that Gemini IV next month will be followed, probably in late August, by Gemini V in which two astronauts will remain aloft for seven days.

Subsequent Gemini flights will range up to 14 days, test the ability of men to leave their craft in the vacuum of space, and train astronauts in rendezvous and docking techniques.

For the latest Apollo test a Little Joe II booster, manufactured by General Dynamics/Convair, was to play the role of a Saturn launch vehicle in trouble at "thin air" altitudes, which start at about 22 miles.

Described as a high altitude abort mission, the test takes place during one of the five critical times during which future astronaut-pilots may have to use emer-

(See SPACE, page 6)

HOOFING IT—Astronaut Charles Bassett gets quick briefing and tour of Northrop Ventura facilities from George Douglas (right), vice president and general manager, before striking out for talks with employees. Close behind are Tom Hughes (left), North American representative for Apollo, and Henry Blazer, NASA plant representative at Ventura. The astronaut addressed NV Management Club that evening.

NO REST FOR TARGETS

Swamped Drone Flies Again

Old Northrop Ventura drones never die.

This fact was brought home last month by Florida National Guardsmen in a combined weekend drill with Virginia counterparts at Camp Blanding, Florida.

They were using a target drone that they fished out of a Georgia swamp last summer and easily put back into service.

No one is quite sure when the drone, an OQ-19 model, was downed originally, but Technical Services and Training Representative Marsh Loane does know that it is of 1953 vintage and that it was found in the impact area of the former Army Artillery Training Center at Fort Stewart, Georgia.

Manufactured by Northrop Ventura between 1951 and 1960, the OQ-19 series was supplied by the thousands to the Army center before it was closed, Mr. Loane said.

Mr. Loane attended the summer camp of 16th Det. (AT), 264 Artillery, Florida National Guard, to instruct Guardsmen in maintenance flying and repair of target drones.

Among guest observers at the combined weekend drill last month was a contingent of German Territorial Forces officers headed by the commander, Lieutenant General Friedrich A. Uebelhack. Territorial Defense Forces is the German equivalent of the National Guard.

The 16th Det. is part of the Air Defense Artillery and is one of 12 National Guard units which shoots down Northrop Ventura target drones.

Technical Services and Training group provides support to all branches of service as needed. In addition to Mr. Loane, the Newbury Park headquarters has Herbert Miller, Jack Bean and Louie Raiola on call.

Resident technical representatives Bill Perrotto supports Navy operations at San Diego; Frank Nesemeier is Navy area resident at Norfolk, Virginia; and Jack Smith is assigned to the Army Artillery Training Center at Fort Bliss, Texas. All technical representatives are under the supervision of Glenn Livingston.

The OQ-19 series now is used primarily by the U.S. Army and National Guard. It is famed as the pioneer target drone fabricated in interchangeable sections to allow rapid replacement of parts damaged during target practice.

The OQ-19 is the forerunner of the Northrop KD2R-5 drone currently in use by the U.S. Navy and foreign countries.

(Photo on page 6)

NAS Obtains New Illinois Facility

Northrop Architectural Systems, wholly-owned Northrop subsidiary based in Los Angeles, began production this month in Murphysboro, Illinois, in a move toward a larger share of the architectural hardware market in the east and midwest.

NAS, which produces the Arcadia line of sliding glass doors, storefronts and entrances and sun control systems, among other products, also has production affiliates in France, Spain and Japan, and has licensing agreements with firms in Norway and Lebanon.

To read more about Northrop Architectural Systems, turn to page 2.

HI, MR. B., GOODBYE CHARLIE

He arrived as Astronaut Bassett, he left as "Charlie."

Despite a heavy work and training schedule at NASA's Manned Spacecraft Center in Houston, Astronaut Charles Bassett II spent most of a day, May 3, at Northrop Ventura in briefings and chatting with the men and women who manufacture the parachute landing systems for both the Gemini and Apollo space flight programs.

Upon his arrival, the 34-year-old Air Force captain was greeted by George F. Douglas, vice president and general manager of Northrop Ventura, and Henry Blazer, NASA representative in the plant.

After emphasizing to everyone that his name was Charlie, not astronaut or captain, he zipped past officials and lines of authority and headed directly to the Paradynamics Laboratory where landing parachutes are sewn and assembled.

A number of sewing machine operators, all expert seamstresses, were surprised and charmed to find the smiling astronaut at their elbow, inquiring about them and their intricate work.

From the Paralab, Charlie moved to the engineering building, where he met many of the people responsible for the design, development and testing of the landing systems which have returned all of the American astronauts from orbital flight in the Mercury and Gemini programs.

Later in the afternoon, he addressed all company employees briefly in the mall. He stressed the necessity for perfection in the manufacture of all components which are used in the nation's manned space flight vehicles.

Monday evening, Charlie met and chatted with more people before and after his main address before the Northrop Ventura

(See CHARLIE, page 6)

BuWeps Representative At Ventura Promoted

Navy Bureau of Weapons Representative William J. Dalzell has been promoted to a full lieutenant, effective March 1, it was announced April 22.

Lt. Dalzell

Lt. Dalzell has been representative-in-charge at Northrop Ventura since June 1963.

A veteran of nearly 19 years Navy duty, Lt. Dalzell began his career as a seaman apprentice at Long Beach. "Sea duty" for the officer has principally involved flying as a crew member in many types of Naval aircraft. He has logged more than 5000 flight hours.

Prior to his present shore duty, he was a member of Airborne Early Warning Barrier Squadron in Hawaii. The mission of his squadron was to extend the Distant Early Warning line an additional 1500 miles to Midway Island from the Aleutian Chain by forming a radar screen of airplanes.

After reaching the highest enlisted grade, Lt. Dalzell was commissioned in 1961.

He and his wife, Eleanor, and their three daughters, Susan, 6, Sally, 4, and Stacy, 3, reside in Northridge. Both Lt. Dalzell and his wife are California natives and boating enthusiasts.

$1000 Check Given California Lutheran

A $1000 check was presented to California Lutheran College in Thousand Oaks last month, representing Northrop Ventura's second annual contribution to support institutions of higher learning.

Dr. Donald A. Hicks, vice president-Technical at Ventura Division, made the presentation to Dr. Raymond M. Olson, president of California Lutheran.

Quarterly CMIP Certificates Awarded 17 Employees

Certificates of achievement for participating in the Northrop Ventura Cost and Management Improvement Program were presented this month to 17 employees in three separate quarterly ceremonies.

Receiving certificates from Manufacturing Vice-President M. A. Maurer were: Andy Andrews, Opal Stafford, Ralph Burkman, Woody Chamberland, Paul Friedman, Marvin Shered, Eugene Fry, Walter Kniffen.

Winners from Manufacturing had already received awards in the Employees Suggestion Awards Program. Their ideas were submitted for further consideration by the Northrop Ventura CMIP committee headed by Les Hudson.

In another area of CMIP activity, honors were handed out to Margaret (Miggs) Ruggiero and Gary Carver, both of Quality Control, by Robert W. Young, QC manager.

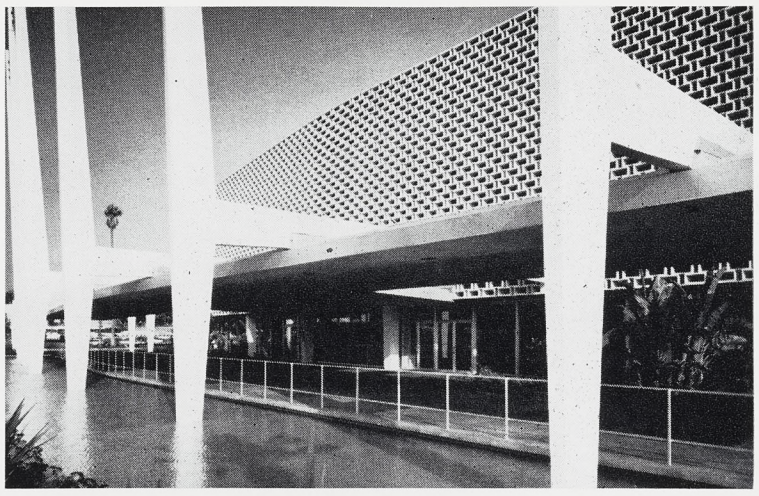
According to Mr. Young, the two employees collaborated in devising a more efficient and economical record system for corrective action follow-up with vendors. The savings was more than $500.

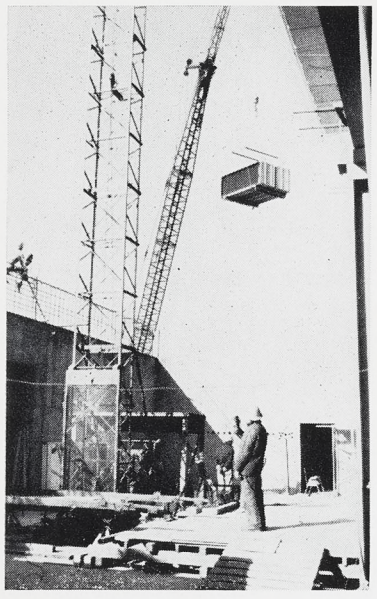
Over in the Technical department, Dr. Donald A. Hicks presented certificates to Bill Coonfield, Doug Finch, Marge Raine, John Luckett, Vera Johnson, Herbert Whetstone, and George Gaudry.

Awards in this group were made for management improvement.

BACK YARD

Local Los Angeles market is not being slighted in period of overseas expansion. Hughes Market (left) in Northridge, Granada Hills, is fronted with NAS entrance, as is Santa Monica Civic Auditorium (right). Numerous Los Angeles area luxury apartment buildings have NAS entrances, sliding doors and other components of an "architectural system."





ON WAY UP

NAS components (above) are hoisted into place during construction of one of many office buildings being built in Southern California. Craftsmen (below) assemble aluminum frame for storefront at current residence of company in City of Commerce. NAS will move to larger facilities in City of Industry this summer.

Northrop Architectural Systems Circles Globe in Business Quest

Moving around the world in three years isn't much of a record in the era of Mach 2 aircraft, unless, like Northrop Architectural Systems, you've established factories and licensing agreements in half a dozen countries on the way.

Like Magellan in the 16th century, the Northrop subsidiary has sailed westward from its front door in Los Angeles and, after establishing itself in Asia and Europe, is presently starting manufacturing in Murphysboro, Illinois, for the eastern and midwestern markets of the United States.

Next July, NAS headquarters will move into new facilities in the City of Industry, about 20 miles from the point of initial expansion in 1962.

President Henry E. North jr., who is as much at home on the continent as in his Fullerton home, spent almost three years in establishing the NAS name around the world.

Of course, his job was made much easier by the quality of his product, the Arcadia line of sliding doors and windows, sun control systems, storefronts and entrances, and window wall systems.

Anyone who asks around the present Los Angeles headquarters about the history of the company would probably get three different stories. That's because there are three different histories.

Acme Metal Molding Company, which was founded in Los Angeles in 1907, was purchased by Northrop in 1960. Arcadia Metal Products, founded by Mr. North in 1948, was acquired in 1961.

The combination of people and technology from these two companies, plus a little seasoning from Norair Division and the Corporate office, is the basis for the "modern history" of NAS.

The reason for naming the product line Arcadia rather than Acme is one of simple salesmanship.

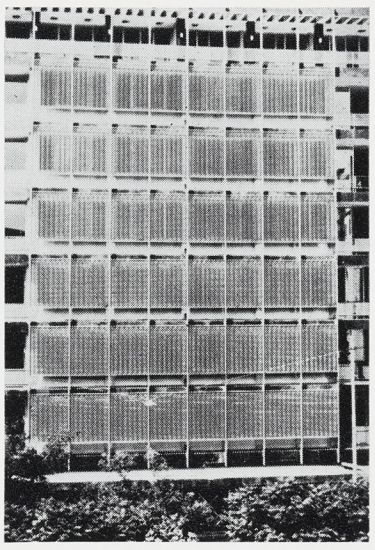
"The word means contentment, pastoral simplicity, a vision of happiness in a land where home and countryside are one," Advertising Manager Pete Vogel says.

"Arcadia is a perfect name for sliding glass doors—a revolution in architecture which has opened homes to a new dimension in living."

It is probable that many Northrop homeowners have NAS doors and windows and don't realize it. Employees of Northrop Space Laboratories in Hawthorne walk through an NAS entrance everyday they come to work.

The Arcadia name is enjoying such public acceptance that NAS

(See NAS, page 5)



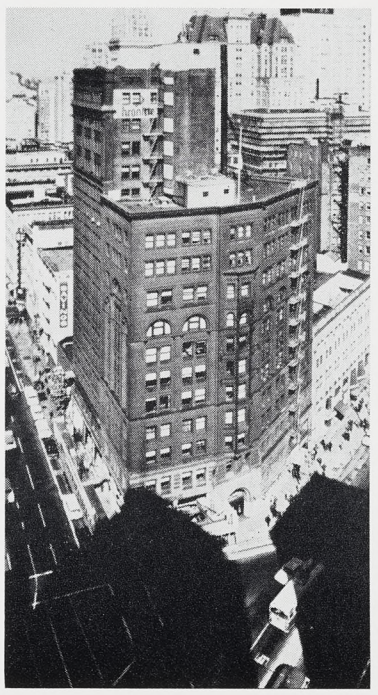
MIDDLE EAST

Building (above) in modern Beirut, Lebanon, is complete with NAS sun control system and entrances. Northrop subsidiary licenses its products through affiliate in Lebanon. Maze of door frames (below) are inspected at Los Angeles plant before glass is installed.

Key elements in system are these NAS executives (from left, top row): President Henry A. North jr., Vice President Don White, Treasurer Dan Hill, New Products Manager Irvine Styer; (from left, bottom row): General Sales Manager Lloyd Johnson, Manufacturing Control Manager Jim Kindred, Advertising Manager Pete Vogel, Marketing and Sales Director Paul Leslie.

FACE LIFTING

In a before and after look at San Francisco office building (right), another area of NAS expertise makes itself evident. Complete modernization transformed complexion of entire block. Colone building (left) in Mexico City uses NAS window wall systems, was early project in growing international market of Northrop subsidiary.



Space Electronics Symposium Led By Norair's Wong

Dr. C. M. Wong, Northrop Norair chief of Structures and Auxiliary Systems is general chairman for the 23rd annual meeting of the Aerospace Electrical Society and the Space Electronics symposium. The symposium is jointly sponsored by the AES and American Astronautical Society May 25-27 at the International Hotel, Los Angeles.

The symposium will include six technical sessions, one evening panel discussion, an industrial exhibit, and a highlighted awards banquet.

R. F. Miller, vice-president-Technical, of Nortronics, and R. M. Dijulio also of Nortronics, will serve as technical directors.

According to Dr. Wong, special awards will be presented to Dr. Wernher von Braun, director of NASA's Marshall Space Flight Center at Huntsville, Alabama, and General Bernard A. Schriever, commander of Air Force Systems Command.

California Governor Edmund G. Brown and Dr. Theodore Maimn also will receive special awards.

Principal speaker at a banquet May 26 will be Dr. B. H. Goethert, chief scientist for Air Force Systems Command.

M. Carl Haddon, corporate vice-president of Lockheed, will serve as toastmaster.

Other luncheon speakers will be Dr. E. R. Stuhlinger of NASA and Dr. W. C. Williams of Aerospace Corporation.

ESTATES

Almost without exception, the courts have held that estates of deceased owners or co-owners of Savings Bonds have no right, title or interest in the Bonds when there is a surviving beneficiary or co-owner. Such decisions have been handed down by courts in least 32 states, including the highest courts of 19 of those states.

NORTHROP NEWS

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ALASKAN LIKES WARM CLIMATE— BUT VIET NAM?

For an Eskimo raised on seal, polar bear and caribou, Nathaniel Ekalook is doing pretty well sampling Vietnamese delicacies in semi-tropical Saigon.

Born and raised at Point Barrow, Alaska — the top of the world — he has just been assigned to Viet Nam on the Back Porch Communications system of Page Communications Engineers, Inc., Northrop subsidiary in Washington, D.C.

A veteran technician on radar and navigational aids projects in Alaska, Nate has also served as assistant to the head of the Electronic and Electrical Engineering Department of the University of Alaska.

Cruise to Catalina Planned by Sailors

Treasure hunts, Sabot races and barbecues will be on the agenda as "added fare" when the Northrop Sailing Club welcomes a new season with a Memorial Day weekend cruise to Catalina Island.

Gathering point will be the Catalina Harbor opposite the Isthmus.

For further information contact NRC Commissioner Bernie Bowen at ext. 2515, Norair.

Air Library Founded

University of Southern California has announced the founding of the Library of Aeronautical History, described by officials as a repository for the history of American air transportation.

Laser Behaves After Dunking In Glycerin by Ventura Team

An unexpected discovery by a 4-man Northrop Ventura laser research team, headed by Dr. Donald V. Keller, may have considerable potential in deep space communications, high speed photography and techniques for determining how and why a laser behaves the way it does.

Laser light is unusual in that it can travel for miles in a straight line without much spreading out. There is a trick to it, of course, and it's done with mirrors.

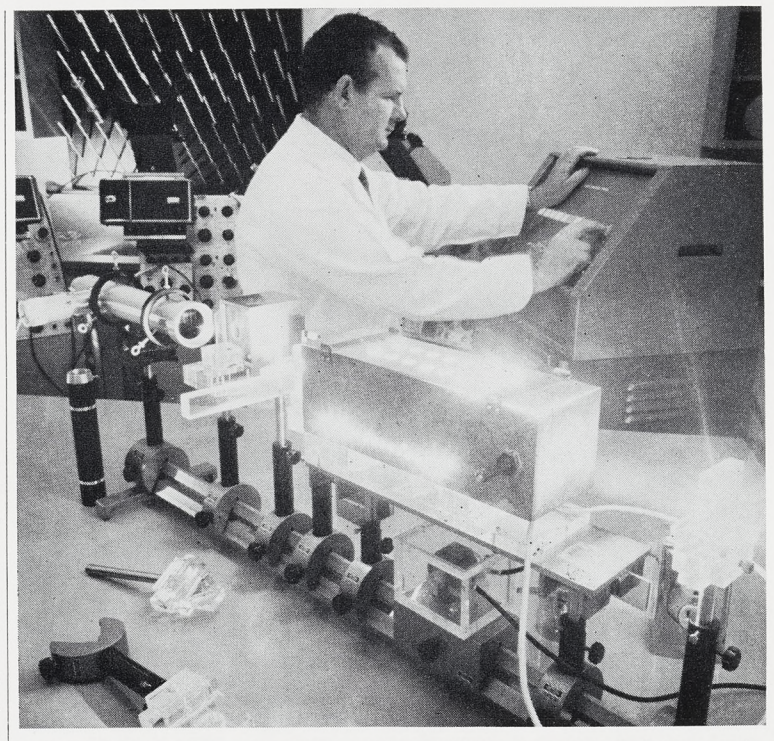
Dr. Keller

A laser is a simple looking device with an astonishing potential. A ruby crystal rod is set into a box with mirrors stationed at each end. A photo flash tube, which looks like it may have come from a neon sign, coils around the rod.

Light from the flash tube excites atoms in the ruby crystal. The atoms return to their normal state, but in so doing they give off a light of their own. This light bounces off a mirror which in turn reflects the light back to a mirror at the other end.

The exchange between mirrors goes on (like a high speed ping-pong game) until a tremendous amount of light is built up from frenzied atoms in the tube. An avalanche of light thus builds up by forcing the excited atoms to return to their ground state and a "souped up" light pulse bursts through one of the mirrors which is partially transparent.

However, there is a problem of control—not in aiming the beam, but in regulating the intensity and frequency of bursts. That's where Dr. Keller, Bert Davis, Marlyn Graham, and John Curnow make their debut.



VENTURA RESEARCH — John Curnow of Optical Laboratory conducts laser experiment which led to unexpected breakthrough in control of laser energy. Deep space communications, high speed photography and laser theory itself stand to benefit from discovery.

They immersed the whole device in a liquid (glycerin worked where other liquids became unstable from the intense heat). They added some original developments in pumping and measurement techniques, and now can control both the frequency and intensity of laser beams.

Dr. Keller isn't saying at this time what causes the phenomenon, but he does know the liquid's index of refraction is part of the key.

It seems that when the light photons are generated in the tube, they bounce at many different angles off the sides of the crystal and the mirror on their way through the rod. Each different light beam dissipates energy. Since there are usually millions of beams bumping around in the tube, the exact amount of energy released through the mirror is never the same.

The refractory characteristics of the liquid tends to reduce the amount of separate reflections (or modes) to a minimum number which can be translated into theoretical equations and solved (with the help of a computer).

With their new techniques, the Northrop Ventura researchers have come up with empirical numbers to fit into existing theoretical equations on the intensity, shape and frequency of the output bursts.

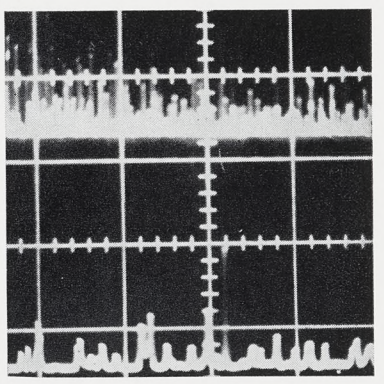
As for the laser theory, the equations checked out for the most part but the significance of Ventura Division's work is in the fact it was the first time the equations could be empirically substantiated at high energies. Also the pulsing is continuous and does not approach a steady output as the theory predicts.

While there has been a great deal of talk about lasers in communications, it has been couched in terms of "potential". Again the problem of "actuality" hinged on controlling laser bursts so they could carry information.

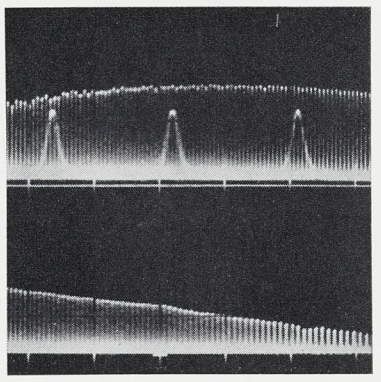
Now, according to Dr. Keller, a high energy ruby laser can meet this criterion for the first time with the immersion technique.

Potential in communications with light beams lies in its "super-short" wavelengths which are measured in millionths of an inch, compared to radiowaves which are tenths of inches and greater.

BRAND X



NORTHROP VENTURA



Oscilloscope reveals breakthrough in controlling laser pulse. Jagged peaks of top photo shows uncontrolled bursts. Bottom photo shows even frequency of pulses as well as controlled intensity.

Former Northrop Assembler Killed in Viet Nam Crash

A former aircraft assembler who learned to fly in the NRC Flying Club, who won the Distinguished Flying Cross in Korea and who became a flying legend in Viet Nam, before being killed last month, was buried May 4 with full military honors at Ft. Rosecrans National Cemetery in San Diego.

Air Force Major William W. McAllister crashed on the eve of his departure from Viet Nam after a year of combat service.

Known as "Mac the Fac" (for Forward Aircraft Control), Major McAllister flew an unarmed, L-19 spotter plane to seek out enemy troops and relay their positions to fighter planes. He survived countless close calls on his low-level passes by sheer daring and piloting skill alone.

His sister, Mrs. Mary Jo Horn, is a budget analyst at Norair.

Major McAllister became interested in flying while working at Northrop during the 1945-49 period. From Northrop he went into aviation cadet training. His mother, Mrs. Ann Ferguson, also worked at Northrop during the same period.

While at Northrop, he worked as a general helper, an assembler in Aircraft Structures, and a template maker.

Major McAllister won national recognition last month in a TIME magazine cover story on American servicemen in Viet Nam.

A family service for Major McAllister was held in Victorville May 3, and a military funeral was conducted the following day in San Diego.

He is survived by his widow, Gail, and two children, Robert and Corey, as well as his mother and sister.

Last Aerial Tours Set for Saturday

Last opportunity for Northrop folk to take an aerial tour of the Los Angeles area will be offered Saturday in "Operation Scoutflight."

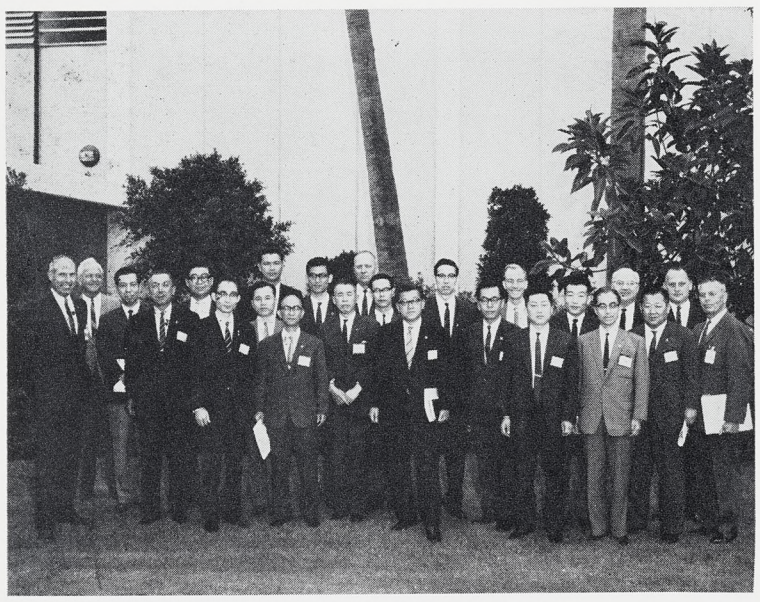
Pacific Southwest Airlines Electra-Jets will depart Los Angeles International Airport at 3, 3:30 and 4 p.m., making a 20-minute flight over and around Los Angeles. Passenger check-in is 3 p.m. at the PSA terminal area. Tickets are now available through the Norair Personnel Activities office.

The cost is $5 per person with proceeds going to support Boy Scout activities in the area.

SAFETY HONORS

Norair's Machine shop was grand sweepstakes Good Housekeeping award winner for March. Frank Lyons (left), Housekeeping awards chairman, and Robert Tompkins, general supervisor, hold symbolic plaque. Looking on are J. M. Brown (far left), and Joe Jarczewski, both of Machine shop.

Japanese Quality Control Team Makes Repeat Visit to Norair



BACK FOR SECOND TIME—Norair was host to Quality Control team of Union of Japanese Scientists and Engineers recently. Visitors are shown above with Norair men who participated in day of presentations. Bob Catlin (left), Norair manager of Quality Control, was host.

Norair Division was host May 6 to a 15-member Japanese Quality Control team representing the Union of Japanese Scientists and Engineers.

Norair was the first stop for the group on a tour to the U. S. and Mexico. Northrop was the only aerospace firm scheduled to be visited.

The visit was a "repeat" for the Japanese organization. One year ago a similar team called at Norair as well as other aerospace firms in the Los Angeles area. They made special requests to have Northrop included on their stop this year.

"Quality Cost System" was the theme of the visit, with special emphasis on Norair's numerical control operations.

R. S. Catlin, Norair manager of Quality Control, was host, along with E. C. "Bud" Bennett, chief of Quality Engineering, who helped arrange the Japanese tour for the American Society for Quality Control which he serves as a national vice president.

Participating in presentations were Vern Parker, Dan O'Halloran, Dave Rankin, Roy Wolford, Clarence McCrary, E. L. Richardson, Chuck Milne, Dan Lund, Ed Regalado, Bob Bullington, Lou Bednarchik, Mr. Catlin and Mr. Bennett.

"We found the talks with our visitors interesting and the exchange of information valuable," Mr. Catlin said. "It is always a pleasure to discuss mutual Quality Control problems on an international basis."

Mr. Catlin pointed out that the Japanese visitors, through their affiliation with the Union, represented a majority of Japanese industrial firms and businesses.

"Thus, our role as host to the group helped to cement already close ties and to improve Northrop relationships with Japan and its industries, a valuable factor in an era when international cooperation is so important."

Russell Black of Northrop Nortronics served as interpreter for the presentations.

NIKE-X VISITORS

Northrop is carrying out contract to support U.S. Army Nike-X Weapon System Project office in area of management services. Recent discussions at Hawthorne brought four visitors (above) with Northrop men for talks and presentations. Group includes (from left): A. J. Patten (Western Electric), Harvey Peebles (Nike-X Project office), T. L. McCarthy (Northrop), Gordon Walker (Western Electric), Joe Olszewski (Nike-X Project office), and R. W. Rolfe (Northrop).

QUALITY CONTROLLERS TRADE NOTES AT L.A. CONFERENCE

Northrop Corporation talent was utilized extensively May 3-5 when the 19th Annual Technical Conference and Exhibit was staged by the American Society for Quality Control.

Participating were some 3000 representatives of national and international organizations who gathered at the Biltmore Hotel, Los Angeles. Conference theme was "Quality—Key to a Nation's Economy."

Norair Division's W. F. Hunt, a Quality Control supervisor, delivered a speech on "The Economy of Numerical Control Inspection" during an Inspection session.

Serving as moderators at various sessions were: R. S. Catlin, Norair manager of Quality Control; Frank McNabb, Nortronics director of Quality Assurance; and E. C. "Bud" Bennett, Norair chief of Quality Engineering. Larry Knight, Northrop Space Laboratories director of Quality Control, coordinated vendor-vendee activities.

Mr. Bennett is currently a national vice president of the ASQC and was among those instrumental in bringing the conference to Los Angeles for the first time this year.

SALLY PUTS STOP TO FORMS FLIP, COLLECTS CASH

Sally Wilhelm has helped put a stop to the forms flip-flop.

Which is one way of saying a Norair Division employee found a quicker, more efficient method for performing a routine task and parlayed the idea into cash ($214) through the Suggestion Award Plan.

Mrs. Wilhelm, a material planner in the Raw Stock function of Material section, noted Shop Orders for requisitioning parts contained five copies with the fifth copy utilized by Materiel and Accounting organizations. The front of the form was filled with information required by the other groups. Materiel personnel were required to flip the form and transfer debit information to the back before adding a code number and credit information, an operation requiring as many as five lines at times.

Mrs. Wilhelm

On a volume of about 46,000 forms per year, this involved a lot of flipping, plus the possibility of human error in transferring information.

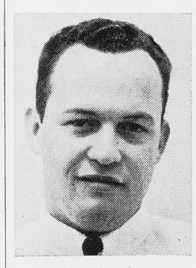
Mrs. Wilhelm further noted Tooling information, one of the entries on the front of the card, was not required in either Materiel or Accounting functions.

She proposed Tooling data be eliminated from the fifth copy and the space cleared be reserved for Materiel information which made it possible to do away with form flipping.

Skeet Shooting Neophyte Takes Southland Trophy

The newest Davy Crockett of Northrop Ventura is a young development planner who, after only six months of practice, is a Southern California skeet champion.

A comparative newcomer to the Division as well as skeet shooting, Ron Parks took first place in Class E competition April 25 at the annual meet held this year at Golden Valley Gun Club.



Mr. Parks

His score of 97 hits in 100 shots topped the number two finisher by five points. Next stop is the California championship scheduled later this summer.

As Class E winner, he became one of five Southland champs. Under rules set down by the National Skeet Shooting Association, shooters are classified according to average scores during the year. While his average of 82 this year had placed him in Class E, his winning the championship automatically advanced him to Class D.

Mr. Parks prefers the close range, high speed competition of skeet to the longer range, slower trap shooting. A round of skeet involves knocking down discs propelled alternately from two control boxes (right and left).

Participants fire from eight locations, moving in a semi-circle from one control box to the other. Closest range is five yards and the longest is 27 yards.

Targets move from 65 to 70 miles per hour and twice during a round, discs are fired from both control boxes simultaneously and the shooter must knock them down one after the other.

Ron joined Northrop Ventura four months ago and is assigned to Manufacturing Controls.

CANOPY CAPERS

It's a Bird, It's a Plane . . . It's Radhoff

For a sky diver with more than 400 notches in his back pack, Northrop's Ron Radhoff has an unusual disdain for his parachute. "Hanging on a canopy" is just a means of saving his life, he says. What he really lives for is that 40 seconds between bail out and pulling the ripcord — a period known as free fall.

"In free fall nothing obstructs the view," he says. "There is a transition to complete quietness when the hum of the engine abates, and there is a feeling of freedom and comfort."

Mr. Radhoff, a designer at Northrop Space Laboratories' Huntsville, Alabama facility, is president of the Huntsville Sport Parachute Club and chairman of the Cottonbelt Parachute Council, which covers seven southern states.

Huntsville sky divers have come a long way since their rather unusual beginning in 1961.

A few enthusiasts got together, read a few books on the subject, bought some equipment, rented a plane and jumped over Pryor Field in Decatur, Alabama.

After the first jumper was safely on the ground, the group discovered his parachute had been packed inside out.

A year later, the club became a member of the Parachute Club of America. With 33 members, including three women, now on the rolls, a set of stringent rules covers club activities, Mr. Radhoff said this week.

"Apprehension may be felt during 15 or 20 jumps," Ron said, "but once a jumper is over the hump and the desire to jump exceeds the fear of it, he is hooked."

Ron believes that at least 100 jumps are required to achieve mastery of control in free fall.

The average jump begins at about 8000 feet, with the chute opened at 2000 feet. Free fall is about 40 seconds and the last 2000 feet takes about two minutes.

"Sky divers can use certain body movements to change direction, maintain balance and move horizontally," according to Ron. "Some amuse themselves with turns and loops. The diver can do almost anything a plane can do except go back up."

A diver's speed of descent varies from 120 to 180 miles per hour, depending on his position, Ron added.

While sky diving is a potentially hazardous sport, strict safety regulations have kept the record clean in Ron's group. In 1500 jumps, there have been only three malfunctions, and in every case the reserve chute has opened.

Big Pomona Event Attracts Gem Club

Norair and Nortronics members of the Gem and Mineral Club have decided to hold an annual Memorial Day weekend field trip by participating in the California Federation of Mineralogical Societies annual show at Pomona.

This event, one of the biggest of the year for lapidary enthusiasts, will feature exhibits and displays unmatched for their color and competitive factors in the area.

The Gem and Mineral Club will enter various exhibits and take part in organized events, according to Commissioners Richard Hicks (Nortronics - Hawthorne) and Dan Kozlow (Norair).

Theme of the show, to be held at the Los Angeles County Fairgrounds, is "Gem Trails of the West."

Participants and visitors are welcome.

DISASTER AID

Shortly after major disasters the United States Treasury moves swiftly to offer cashing facilities and replacement of bonds lost by fire, flood or other catastrophe.

"ROYAL WELCOME" AWAITS YOU, TOO—The world's most famous mouse, Mickey, took over recently for a preview tour of Disneyland for Norair's Dick Pryor and Eleanor Heldt, Disneyland group sales administrator, who are mapping plans for Northrop families visiting the fun center May 28.

'Royal Welcome' Planned By Disneyland for Northrop

One of the world's most fabled and exciting fun spots — Disneyland—served notice this week it is mapping a "royal welcome" for Northrop May 28.

That's when all of the facilities in this fabulous recreation center will be reserved exclusively for Northrop family use.

The general public will be cleared from the park prior to the "magic hour" (7:30 p.m.) and until normal closing everything will be "just for Northrop."

Holders of Northrop - issued tickets may then enjoy rides, featured entertainment, attractions and facilities throughout Disneyland without charge. Naturally, usual concession and shooting gallery charges will be made.

Included is dancing in the popular Tiki Room as well as a chance to enjoy Frank Sinatra jr., the Pied Pipers and the Tommy Dorsey orchestra performing just for Northrop people.

Last year more than 9500 Northrop folk took part in this event.

So make a date and plan to renew old friendships with other Northrop employees at this big event, made possible through the joint effort of Northrop Recreation Clubs. It happens only once a year and this year is on the eve of a long Memorial Day holiday period.

CREDITORS

In several significant cases, courts have held that Savings Bonds registered in co-owner and beneficiary form, were not within the reach of creditors of the deceased owner, even though the estate was insolvent.

NAS: Modern History Is One of Expansion

(Continued from Page 2)

is directing merchandising effort to the direct consumer market, after dealing for five years almost exclusively with architectural firms and major builders.

"Of course, we'll still rely on architects and builders for our biggest share of business," Mr. Vogel said, "but a series of test advertisements in real estate sections of some of the country's leading newspapers have revealed a tremendous potential in direct consumer sales which have benefited our dealers and distributors."

Northrop employees are invited to inspect the doors and may purchase them at a special employees price.

To Jim Kindred, manager of Manufacturing Control, these new developments are just more stages in the evolution of his company. He has survived through adaptability to change. Now in his 29th year of service, he is the longevity champ of both of the companies which today are Northrop Architectural Systems.

An Acme alumnus, Jim joined up in 1936, when the company was called California Fireproof Door. As a youngster, he swept floors and earned $16 a week.

Through his father-in-law, the late August (Gus) Goetz, Jim's familiarity with the company goes back to the beginning (1907), when the company was chartered as California Planing Mill. Gus Goetz retired in 1960 after 53 years with the company.

Jim joined the Purchasing department in 1952, when the company changed its name to Acme Metal Molding. He later became plant manager.

Mr. Kindred has been witness to many changes other than administrative.

He has seen in a short time consumption of aluminum at NAS grow from a few thousand pounds a month to 7 million pounds a year. He has seen the product line grow from storefronts and entrance doors to a broad spectrum of architectural commodities.

He has observed the shaping of technologies, such as extruding and anodizing.

He looks ahead with an uncommon perspective and thinks the use of aluminum is still in its infancy.

He thinks Northrop made a pretty smart move when it selected two going concerns to organize NAS.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Ford, 1961 conv., r/h, w/w, V-8, p/s, p/b, good tires & top, $995 or $200 & take over pymts. L.A. 45, 674-2762. A

Roller Skates, Chicago, shoe-type, size 9, $5. Playa del Rey, EX 1-4860. A

Dinette Set, table & 4 chairs, bronze finish, $25. Inglewood, 677-4540. A

Cadillac, 1953 Fleetwood, 4-dr., air cond., $295. Alhambra, AT 4-5698. A

Live Bait Tank, fibreglass, 20-gal. cap., $17.50. Torrance, 323-0180. A

Chevrolet Impala, 1958, 2-dr. h/top, 348 eng., 3-spd., $550. Gardena, DA 4-0158. A

OLDSMOBILE, Starfire cpe., 1962, full pwr., elec. windows, seat, 48,000 miles, 1 owner, new tires, $2100. Huntington Pk., 589-9503. A

Dining Table, blond oak, drop-leaf style, 40″ wide x 20″, opens to 58″ or 88″ length, $15. Hawthorne, OS 6-0049. A

Refrigerator, 2-dr., automatic defrost, $50. Redondo Bch., 378-1038. A

Socket Ratchet Set, midget w/hand tools, $5. L.A., PL 4-0817. A

Washing Machine, 14-lb. cap., Norge, 1964 model, $125. Anaheim, 828-2440. A

Shop Smith w/accessories incl. blades, cutters, flex shaft cable & chuck, $150. W.L.A., GR 2-2818. A

Golf Clubs, Wilson Middlecoff, $15. L.A., OR 0-1005. A

Air Conditioner, Mark IV for Suburban auto w/mounting, $50. Anaheim, PR 4-2779. A

Hardtop, white, for 1963-65 Corvette, $210. Playa del Rey, 397-6326. A

Oldsmobile Cutlass, 1964, V-8, auto. trans., p/s, p/b, r/h, w/w, $2550. Torrance, DA 9-5364. A

Dishwasher, Lady Kenmore, lge. cap., portable, copper-tone finish, less than 1-yr-old., $140. Torrance, 835-3985. A

Own-Your-Own Apt., near new, 2-bdrm., 2-bath, all elec., pool, hobby room, low taxes & maintenance, $20,500. Gardena, DA 3-2350. A

Camera, Argus C3 w/flash & case, $20. Torrance, FR 1-2705. A

Wedding Dress, full length, straight w/detachable train, size 9, $40. Manhattan Bch., 374-3881. A

Guitar, Spanish classical, nylon strings, instruction books & music, $35. Manhattan Bch., 379-4775. A

Home, 3-bdrm., hardwood floors, 1½ baths, fenced patio, detached gar., $700 dn. pymt. to FHA loan, $17,200. Anaheim, 528-6914. A

Fiat 1100, 1963 4-dr. sedan, $750. Inglewood, 674-8419. A

MG-TF 1500, new top, brakes & clutch, good eng. & tires, wire wheels, low actual mileage, $675. Manhattan Bch., FR 2-0540. A

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Del Amo Blvd. & Paramount, Lakewood. Kathleen D. Plumb, ext. 2605, 379-3968. 2

Ventura Blvd. & Fallbrook, Canoga Park. Veronica Stockard, ext. 1814, 1480, 347-4200. 2

7:30 a.m. — 4:15 p.m.

Calle de Madrid & Colusia, Redondo Beach, Sharon Lynn Seaholm, ext. 1534, FR 5-4860. 3

8 a.m. — 4:45 p.m.

Quail Run Rd. & Donnis, Los Alamitos. W. W. Stark, ext. 1428, GE 1-0843. 5

Balboa or San Diego Fwy. & San Fernando Mission Blvd., Granada Hills. Francis A. Morse, ext. 4221, EM 3-2933. 5

Rides Offered

7 a.m. — 3:45 p.m.

Ventura Blvd. & Fallbrook, Canoga Park. Veronica Stockard, ext. 1814, 1480, 347-4200. 12

7:30 a.m. — 4:15 p.m.

Crescent & Hwy. 39, Buena Park. D. H. Eaglin, ext. 2655, TA 8-2857. 13

8 a.m. — 4:45 p.m.

Quail Run Rd. & Donnis, Los Alamitos. W. W. Stark, ext. 1428, GE 1-0843. 15

Balboa or San Diego Fwy. & San Fernando Mission Blvd., Granada Hills. Francis A. Morse, ext. 4221, EM 3-2933. 15

For Sale

Rug & Pad, 9′x12′ white oval, Karastan, 100% plush pile wool, $135. Hermosa, FR 4-2135. A

Go-Cart, new chassis & engine, $65. L.A., 476-1635. A

Cabin Cruiser, Bryant, 20′ 8″ beam, 50 hp. Evinrude eng., elec. starter & generator, bait tank, sleeps 3, Continental trailer, $2200. L.A., PL 6-5775. A

Pickup, 1961 GMC, ½-ton, V-6 eng., low mileage, hvy. duty rear bumper, r/h, 3-spd., $1100. Hawthorne, 676-6980. A

Ping-Pong Table, regulation size, $20. Hawthorne, OS 6-8842. A

Power Mower, reel-type, Sears Craftsman, $30. Hawthorne, OS 5-5574. A

Pontiac Catalina, 1964 conv., auto trans., all power, r/h, $2750. Santa Monica, 393-7464. A

Refrigerator, Admiral, apt-size, turquoise, 1-yr-old, $90. Anaheim, 635-1719. A

Baby Crib w/mattress, $15. Gardena, DA 3-4116. A

Ford, 1957 conv., new top & w/w tires, p/s, p/b, r/h, $500. P.V. Penn., 377-5084. A

Stove, Kenmore Maid-o-matic w/griddle, 5-burner, rotisserie, 2 auto. ovens & broiler, $125. Hawthorne, OS 6-1404. A

Refrigerator, Electrolux, gas, family size, $25. San Pedro, TE 3-9455. A

Washer-Dryer Comb., elec., Lady Kenmore, 5-yrs-old, $50. Hawthorne, OS 5-1860. A

TV, 19″ Zenith, portable, 2-yrs-old, $65. Hollydale, ME 3-2395. A

Volvo, 1963, white, 2-dr., PV544, 24,000 miles, $1395. Reseda, DI 3-3824. A

House Paint, Latex, 2 gals., Dutch Boy ext., white, $9. Walteria, FR 8-4036. A

Bicycle, Royce Union, 3-spd., boy's, full size, w/access., $35. Redondo Bch., 379-7966. A

Range, gas, Gaffers & Sattlers, clock w/timer, $75. Redondo Bch., FR 9-9926. A

Honda, 50cc, extras, 1963, $250. Manhattan Bch., 379-6442. A

Home, 3-bdrm., 2-bath, rumpus rm., fireplace, dishwasher, water softener, patio, fenced yd., sprinkler sys., $27,550. Yorba Linda, 528-2577. A

Furnishings for living room, kitchen & bedrooms & misc. items, $410. Paramount, 630-1997. A

Volkswagen, 1964 sedan, 9000 miles, w/s/w, radio, $1650. Torrance, DA 7-8994, DA 9-9464. A

Ford Galaxie 500 XL, 1963, Cruise-O-Matic, p/b, p/s, r/h, factory air cond., stereo tape, $2100. Gardena, 679-2592. A

Studebaker, 1955 Commander, V-8, 2-dr., stick, $150. L.A. 45, 677-0471. A

Ski Boat, 18′, Chrysler powered, many extras, $3500. Norwalk, UN 5-8863. A

Range, Western Holly, gas, $20. Gardena, OS 5-1660. A

Boat, 16′ Burchcraft runabout, trailer, recently o/hauled, 85-hp Merc 800, new 100 amp bat., bait tank & pump, compass, many access., $700. Gardena, DA 3-9003. A

Gym Set, top bar, tubular steel, 9′ long, 2″ diam., $10. L.A., PL 5-7521. A

Chevrolet Bel Air, 1957 2-dr. h/top, record player, new trans., tires & chrome reverse rims, 50,000 orig. miles, $975. Hawthorne, 371-0194. A

Telescope, 8″ Newtonian, 1/17th wave, 3 eye pcs., acro Barllow hvy. prof. mount & clock drive, $1000. Rolling Hills, FR 7-2685. A

Scuba Gear, Voit single-stage, U.S. diver's 2-stage w/J-valve, constant reserve tanks, $130. Hawthorne, 676-4251. A

Camera, Argus C4 w/case, $25. L.A. 45, 670-2564. A

Jeepster, 1951, 4-cyl. o/d, r/h, smog device, new top, curtains & battery, $450. Harbor City, 325-0221. A

Ford, station wagon, 1957, V-8, 4-dr., r/h, w/w, p/s, $500. Palos Verdes Est., FR 5-5097. A

Rug, 9 x 11; nylon tuft; black & white speckle, 6-mos.-old, $25. Redondo Bch., FR 6-6415. A

Camera, Polaroid, Model J66 w/elec. eye, leather carrying case, $70. Hawthorne, OS 9-6334. A

Plymouth Sport Fury, 1964, 383 cu. in. torque flite, chrome rims, vibrasonic radio, extras, $2350. Manhattan Bch., 372-4951. A

Headboard, queen size, tropical finish, $20. Pacific Palisades, GL 4-4270. A

House Trailer, 25 ft. long, $500. Lawndale, 675-9389. A

Boat, 16′, cabin wood & glass, 35 hp Elgin, fully equipped, trailer, $425. Torrance, 320-3074. A

Mobile Home, Roadcraft, 50′, w/enclosed cabana, 8 x 35, screens & louvered windows in cabana, 8 x 8 steel storage room, $4500. Gardena, 329-5879. A

Chevrolet, 1954 tudor, $150. Inglewood, OR 1-1660. A

Step End Table set, dark fruitwood, leather tops, $20. Torrance, DA 6-5457. A

Movie Camera w/auto. projector, used twice, 8mm turret lens, $100. Reseda, 343-6948. A

Camper, 1964, Corvair 95 Greenbrier, 4-spd., 21,000 miles, fully equipped for 2, $2450. Hawthorne, 675-9557. A

Range, gas, 30 in., Hardwick w/no-fog window, auto. oven pilot & broiler, less than 2 yrs., $75. Wilmington, 835-2328. A

Cad., 1956, 2-dr., 2-tone blue, good tires, full power, $600. L.A. 45, 645-8278. A

Falcon, 1960, 4-dr., sed., auto. trans., r/h, w/w tires, $595. Torrance, DA 5-3724. A

For Sale

Surfboard, Bing, 9 ft. 7 ins. long, 4 stringers, $90. Encino, 987-2047. A

Picycle, boy's 26″ racer, $15. Inglewood, PL 5-4497. A

VW roof rack, oak slats, $15. L.A., 478-5732.

Carbine, M-1, 30 cal., $50. Manhattan Bch., FR 2-3878. A

Acreage, ½ acre Oregon river front lot, $1495. San Pedro, TE 3-9118. A

Engine, Corvette 6, 1954, solid lifters, Carter side draft carbs, tri-log alum. manifold & dual headers, need new rings, $150. South Gate, 569-2261. A

Wanted to Buy

Maternity Clothes, size 12. Palos Verdes, 377-4616. B

Plastic Pool, approx. 12′ to 15′, 4′ deep, must be reasonable. Box 701. B

Ford, Chevrolet, Plymouth or Dodge, 1953-1958, that needs mechanical repair, price must be reasonable. Inglewood, 755-1071. B

Cabinet, redwood, approx. 6x6. Hermosa Bch., FR 2-6556. B

FREE (To Be Given Away)

Kittens. Hawthorne, 676-7746. D

Rentals Offered

Apt, deluxe, 1-bdrm., built-ins, pool, $90 mo. Redondo Bch., 376-2117. E

Cabin, Green Valley Lake, $35 weekend, $65 week. Torrance, 320-2002. E

Apt, 2-bdrm., unfurn., close to schools, churches & shopping center, $115 mo. Torrance, 323-6231. E

Apt, 1-bdrm., unfurn., built-in stove, closed gar., laundry facilities, $85-$89 mo. Torrance, 320-1005. E

Apt, 2-bdrm., deluxe, furn., lge. pool & patio, near El Camino Col., $135. Torrance, DA 9-5986. E

Apt, 1-bdrm., garage, unfurn., near Cabrillo Beach, $80 mo. San Pedro, TE 1-3483. E

Apt, unfurn., 2-bdrm., pool, built-ins, $115 mo. Torrance, 323-1946. E

House, 2-bdrm., unfurn., children ok, 10 min. from Northrop, $120 mo. Gardena, DA 9-9621. E

Studio Apt, 3-bdrm., 2-bath, owner's unit, forced air heat, pvt. patio, closed gar., hobby shop, 2 children ok, $165 mo. Torrance, FR 5-0867. E

Cabin, A-frame, at Big Bear Lake, Moonridge area, sleeps 6 adults or 4 adults w/children, $30 weekend, $80 wk. P.V. Est., FR 7-3888. E

Apt, 2-bdrm., near ocean, $155 furn., $140 unfurn. Santa Monica, EX 3-7067. E

House, 2-bdrm., in rear, 1-car gar., parking, disposal & thermo heat control, adults, $100. Pico Rivera, 692-9991. E

Duplex, 2-bdrm., pvt. yard, enc. garage, trash & water paid, adults, $95. Inglewood, OR 7-2448. A

Apt., 2-bdrm., unfurn., built-ins, patio, $115. Hawthorne, 676-5622. E

Apt., 3-bdrm., 2-baths, walk-in closets, soundproofed, patio, forced air heat, carport, $185 mo. Hawthorne, 839-5086. E

Studio Apt., 2-bdrm., 1½ baths, built-in range, hot water pd., furn. or unfurn., 6 blocks to Norair, $130-$160. L.A. 44, PL 5-7854. E

Apt., close to schools, transportation, 2-bdrm. $95; 3-bdrm. $118 mo. No. Long Bch., 422-6169. E

Apt., owner's duplex, 4-bdrm., 1¾ baths, 1-yr.-old, lge. backyard, 2 blocks to school, walking dist. to Centinela Pk., lease, $195 mo. Inglewood, 673-4274. E

Apt., unfurn., deluxe 2-bdrm., 2-bath, fireplace, laundry serv., free hot water, near Norair, $135 mo. Hawthorne, 679-1358. E

Apt., 2-bdrm., 1 block from Norair, $120; 2-bdrm., furn., $135. Rolling Hills, FR 7-4926.

House, 1½ bdrm., furn., ½ block from ocean, gar., references, $130 mo. Manhattan Bch., FR 4-5028, FR 9-8700. E

House, 2-bdrm., natural wood cabs., close to all shopping & schools, tile bath & kitchen, pvt. gar. & patios, fenced yd., $110 mo. Lawndale, OS 9-8426. E

Rentals Wanted

Apt, 2-bdrm., unfurn., in Westchester, $120 mo. Hawthorne, 675-2027. F

Experienced boat operator wishes to rent a trailered power boat, 16x18, adequate power for skiing for wk. in May or June. Torrance, 378-8181. F

Personals

We Wish to express our thanks & the warm welcome of friends. The expression of sympathy at a time when it was deeply appreciated in the passing of Glen A. Smith, my husband, & father of Glen, Jr. & Tim Smith. MRS. GLENN A. SMITH. L

Ironing in my home, $1 hr. Hawthorne, 675-6291. L

Woman w/1 child share 3-bdrm., 2-bath home w/single or woman w/1 child, lge. fenced yard, 5 minutes from Norair. Gardena, 323-3245. L

For Sale or Trade

Honda, 305 Dream, 1964, take over $32 mo. pymts., $546 bal., or trade for old Triumph BSA or dirt bike. Redondo Bch., FR 9-9985. M

Chain Saw, 20″ lightweight, $100 or trade for early model 74 Harley motorcycle in running condition. Gardena, OS 5-2159. M

Apt., 4-unit, Fullerton State College district, $61,500 or trade for lg. lot or more units. Buena Pk., TA 8-2857. M

Venturans Attend Safety Congress

Six Northrop Venturans last month attended the 12th Annual Western Safety Congress presented by the Greater Los Angeles Chapter of the National Safety Council.

Joining more than 6000 delegates at the Ambassador convention center were Clyde Corder, Wes Mace, A. P. Binsacca, Moss Stripling, Richard Cooper, and John Steman.

Of special interest to the six—among 25,000 square feet of exhibits—were presentations on propellant toxicity, explosives and health physics of laser exposure.

Mr. Binsacca is chairman of the Ventura Division Hazardous Materials committee, which provides safety guidelines for use of such materials.

Ties Mark Bridge Event Standings

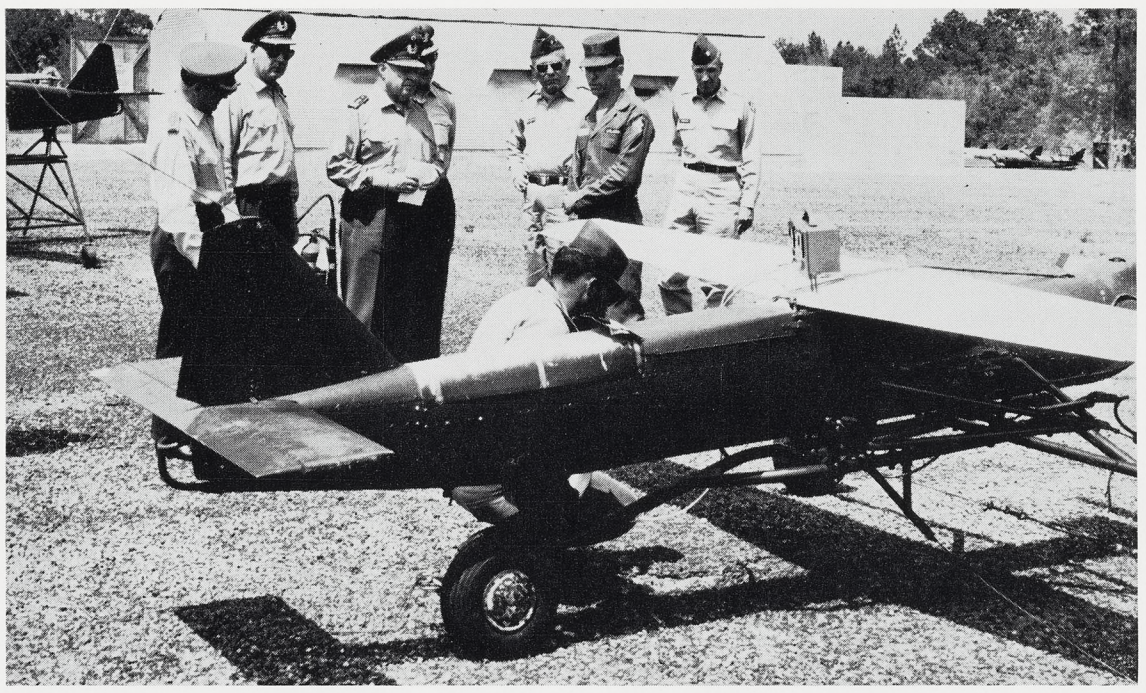
Had they paid off on ties, almost everyone would have been a winner during the just-concluded Northrop Ventura Bridge Club Individual Championship tournament, Commissioner Tammy Tracy reports.

Bob Tracy and Bill Fischer deadlocked for first with comparative scores giving the top spot to Bill and second-place to Bob.

Which left quite a muddle for third-place with Ron Castro, Bob Cole, Bill Coonfield and Harry Wirth all tied.

Trap Shoot Scheduled

Northrop Ventura Rod and Gun Club members have set June 12 as the date for their next trap event, to be held at 10 a.m., at the Aqua Sierra Gun Club. Rusty Rursch copped honors at the May 8 shoot, winning over a field of 13 participants.



DRONE SPIEL—Commanding General Friedrich Uebelhack and three staff officers of the German Territorial Defense Forces are briefed on Florida National Guard's use of target drones. This Northrop Ventura drone (OQ-19D), vintage 1953, was salvaged by guardsmen from Georgia swamp and put back into service. Major General Henry W. MacMillan (third from right), Florida adjutant general, hosted the German officers at recent weekend drill.

CHARLIE: He Gains a Rooting Section

(Continued from page 1)

Management Club in the Division cafeteria.

Some 200 persons who attended the dinner heard a description of the progress and objectives of the two-man Gemini space program as it leads toward the prime goal—the Apollo program to land Americans on the moon, and return them safely to earth.

"The space program now is equal to all the largest exploration programs in history," he said. "Also, this is the first time in history that we have had a national goal not associated with war. The space program is bringing rapid change to all branches of science and technology.

"Even more remarkable," he said, "is that so much has been accomplished so far without human injury or loss of life. I don't believe any major experimental airplane program has ever been carried out without losing someone.

"The space flight record of safety so far is unique within our industrial complex and our technology.

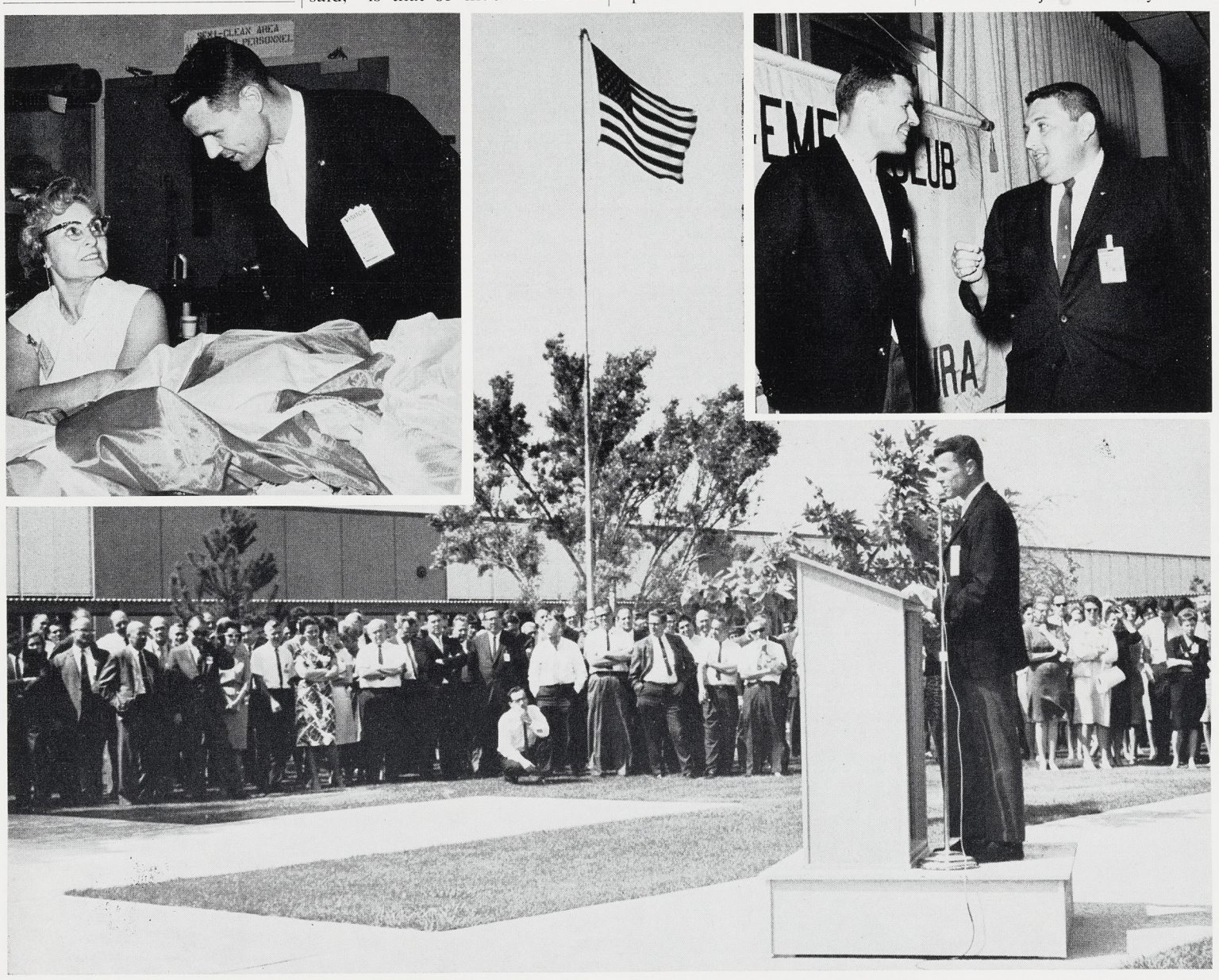
"We'll probably have a problem some day," the astronaut added, "but if it happens we must be able to take it in stride and then buckle down even harder to our work."

The astronaut was questioned about the "jolt" which Astronauts Virgil I. Grissom and John Young received in the final moments of the first Gemini flight in early April.

This occurred at a point in the landing system sequence in which the spacecraft is converted from a vertical to near horizontal landing position. Grissom and Young reported that when they pressed the button for this maneuver, they were thrown forward and their heads struck the instrument panel.

"If that's the only problem we ever have," Mr. Bassett said, "I'll be very happy about it.

"At the end," he said with a smile, "Gus and John came down near Grand Turk Island (in the Bahamas) soft — very softly — thanks to you. I hope you people at Northrop Ventura will let all of us down just as softly."



A SMILE FOR ALL—Astronaut Charles Bassett addresses employees in mall at Northrop Ventura. Earlier he moved through Paradynamics Section where he chatted with individuals such as Mrs. Lena Conti (top left), a seamstress on landing system parachutes. That evening, the astronaut addressed Management Club and had more informal chats such as with Lou Florence (top right), project administrator on Apollo landing system.

Blood Bank Credit Gets Big Boost

Northrop Ventura credit with the Tri-Counties Blood Bank was doubled April 28 when 134 volunteers turned out to give blood during a bloodmobile operation at the plant.

Because of normal rejections, only 83 pints of blood were collected.

This blood, along with some 80 pints previously collected, is now deposited with the Blood Bank and is available to employees and their immediate families without cost.

In addition, employees and their families may also draw blood anywhere in the United States in emergencies through the affiliation of Tri-Counties with such agencies as the Red Cross and other comparable organizations handling blood.

Normally, Northrop Ventura credit is decreased by approximately 10 pints each month as blood is given to replace that supplied employees and their families. In some months, the decrease is larger.

For this reason, the bloodmobile will again be scheduled for a visit to Northrop Ventura in either October or November, according to Nurse Elinor Eckels.

In-Plant Tetanus Shots Available

A free tetanus inoculation program will be available in-plant to all Northrop Ventura employees June 4.

Signup cards for the program have been distributed and should be returned to Medical Services as soon as possible so that arrangements may be completed. Individuals will be notified when to report for the inoculations.

Nurse Elinor Eckels reports the program was arranged as a service to employees. The summer months, with camping, fishing, swimming and outdoor sports popular, are most likely to include dangers from tetanus or "lockjaw."

Also, each shot is good for only about five years after which a second or "booster" shot is needed. The last in-plant inoculation program for tetanus was in 1959.

Dr. Richard Krebsbach, Norair physician, will head a medical team administering the inoculations.

SPACE

(Continued from page 1)

gency procedures in aborting their flight.

Under scrutiny is the separation and flight of a launch escape vehicle which, after separation, will coast to a maximum height of about 33 miles, according to North American Aviation, Inc., manufacturer of the Apollo spacecraft.

Second major objective is to test equipment designed by Lockheed Propulsion Company to stabilize the tumbling escape vehicle's command module.

In today's test, the vehicle is slated to travel about 110 miles down range and reach an altitude of 175,000 feet during a 10 minute flight.

The Apollo landing system, which consists mainly of three 83-foot parachutes, passed its major test with floating colors last December 8 at White Sands.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 8 | June 2, 1965

Nine Months Income Tops $6.1 Million

Northrop had consolidated net income of $6,136,000 for the nine months period ended April 25, 1965, compared with consolidated net income of $4,679,000 for the same period a year ago, according to Thomas V. Jones, president and chairman.

The nine months' earnings are equivalent to $1.50 per share on the 4,097,939 shares outstanding at April 25, 1965. This compares with per share earnings for the first nine months of the last fiscal year of $1.15 on the 4,081,522 shares then outstanding.

Consolidated net sales for the first nine months totaled $255,894,000, compared with consolidated net sales of $219,252,000 for the same period a year ago.

Consolidated net income for the quarter ended April 25, 1965, was $2,116,000, equivalent to 52 cents per share of common stock, compared to last year's third quarter consolidated net earnings of $1,405,000, equivalent to 34 cents per share.

The company's backlog of sales was $314,000,000 at April 25, 1965, as compared with approximately $340,000,000 in backlog a year earlier.

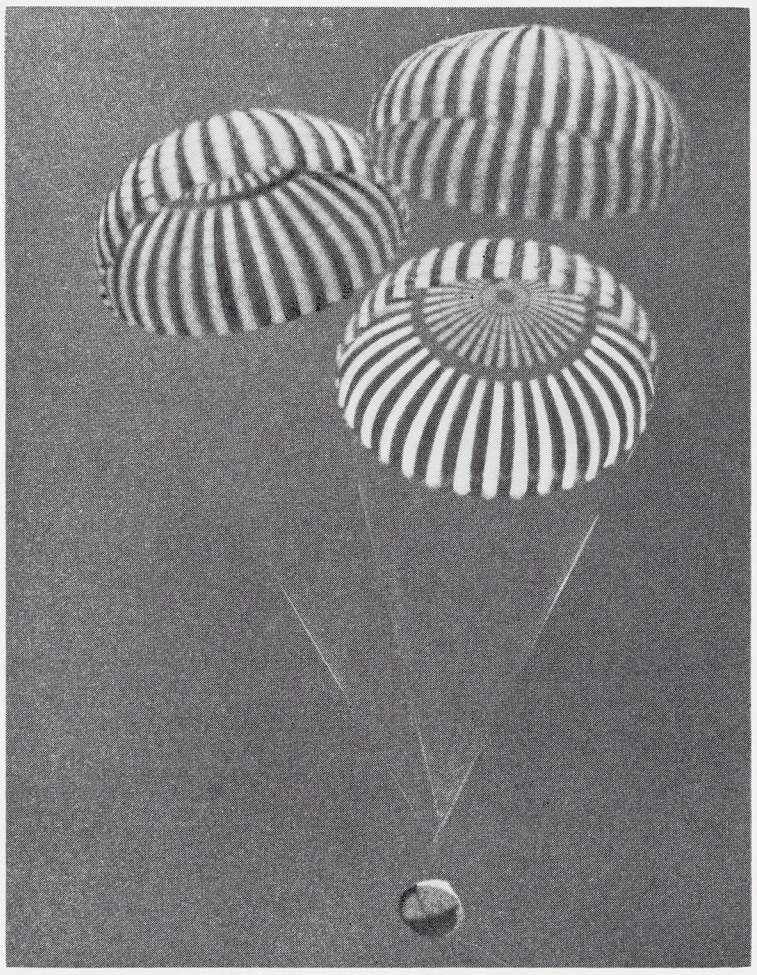
At the regular monthly meeting, the company's directors declared a quarterly dividend of 25 cents per share, payable June 16, 1965, to shareholders of record June 2.

MERCY MISSION FLOWN BY T-38

An Air Force T-38 Talon recently flew a successful supersonic errand of mercy under circumstances and in a setting that had all the earmarks of a space-age Pony Express.

The seven-month-old son of an Army Warrant Officer required Vaccinia Immune Globulin to combat after effects of a vaccination. Fort Carson, Colorado, Army officials determined the nearest source of the vaccine was

(See MERCY, page 6)



THREE FOR THE MONEY—Three 83-foot parachutes lower test version of Apollo spacecraft, as part of Northrop Ventura program for North American Aviation Inc., principal spacecraft contractor to NASA.

VENTURA READY TO RECOGNIZE SUPERVISORY SEMINAR GRADS

A select group of Northrop Ventura supervisors will receive recognition next week (June 9) upon completion of study in a current Supervisory Seminar.

Each will receive a certificate of completion, plus special thanks from top management for their efforts in improving their management capabilities.

The current Supervisory Seminar, which began May 10, is one of a series held at Ventura over the past two and one-half years.

Supervisory Seminars are designed to give attending supervisors an intensive review of management techniques and principles. Key objectives are to enable the supervisor to improve his skill as a leader and to better understand his role as a member of management.

Participants take part in 20 hours of class work, attending from 4 to 6 p.m. two days each week.

L. L. "Verne" Reynolds, Northrop Norair Management Development specialist, serves as Seminar instructor. Mr. Reynolds has a broad and extensive background, including both formal education and experience, in the field of supervisory development.

Last "graduates" of a Supervisory Seminar received completion certificates May 5. H. E. Riggins, Ventura vice president-Administration and assistant general manager, spoke to the group at its final session and presented certificates.

Northrop Chutes Given Credit for Saving Apollo Test

National Aeronautics and Space Administration officials have expressed more confidence than ever in the Apollo escape and recovery system, after the equipment was put to an unscheduled, spectacular test at White Sands Missile Range, New Mexico, May 19.

NASA credited the Northrop-built parachute recovery system with playing a key role in successfully landing a test version of the Apollo spacecraft after a Little Joe II booster exploded after 25 seconds of flight.

The original test plan provided for the boilerplate, unmanned version of the Apollo spacecraft, to be rocketed to an altitude of 33 miles by a Little Joe II booster. When the booster broke up after 25 seconds of flight, the escape and recovery system went into action automatically and functioned perfectly.

The boilerplate Apollo was landed intact three miles from the launch pad beneath the three 83-foot orange and white main parachutes developed and manufactured by Northrop's Ventura Division.

"That was the prettiest bunch of silk I've ever seen," commented astronaut Donn Eisele, who one day may be scheduled for a lunar flight aboard an Apollo spacecraft.

Another astronaut, Richard F. Gordon, said "From this event today, I feel great confidence in the escape and recovery system."

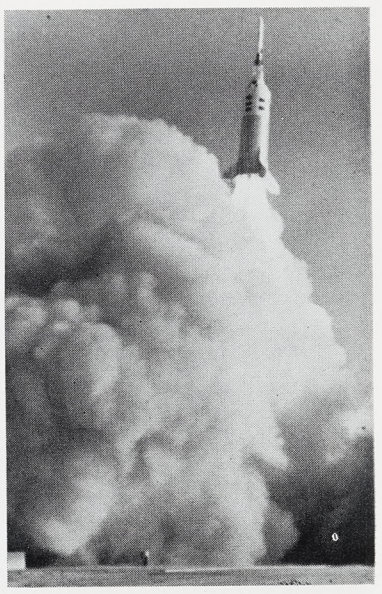
Dr. Joseph Shea, NASA's project director for Apollo, said the premature breakup of the booster apparently was caused by a faulty autopilot, which introduced an excessive roll rate.

Dr. Shea commented, "It was a 'free' demonstration of the escape system and a real one. The command module is resting out there on the desert floor. If there had been astronauts on board, they would have been unharmed."

Two days after the test, Dr. Shea provided more details to a convention of Aviation/Space Writers at Albuquerque.

". . . The parachutes deployed forward into the airstream, a most difficult condition, but they did all right. The spacecraft did three complete tumbles, then stabilized.

"The mains came out. It would have been a wild ride, but the landing was good; it descended gently."



Little-Joe II booster aloft with Apollo module at White Sands Missile Range. Seconds later the booster exploded putting recovery and escape system through unusual test.

MUCH-TRAVELED DRONES READY, WEATHER IS NOT

Not all Northrop Ventura drones fly. There are some that just sail . . . and sail . . . and sail.

Like the KD2R-5 target drones shipped to the Royal Navy and brought back to Point Mugu, California, for a demonstration of Britain's Seacat missile.

High-ranking U.S. Naval officers were scheduled to observe the demonstration, but weather conditions cancelled the aerial target practice even though the KD2R-5 can fly in all types of weather.

Instead the H.M.S. Kent, a modern guided missile destroyer, had to be content with sinking surface targets provided by the Navy Missile Center at Point Mugu. The KD2R-5's went back into the hold.

Seacat is a short-range ship-launched missile controlled by an "aimer," who observes the missile in flight and directs its course by a radio command link.

NEW Ph.D.'s THINK SO

Is Crisis Brewing in Graduate Education?

The chances of a man in industry obtaining an advanced degree, particularly a doctorate, will get slimmer every year, it was agreed this week by two Northrop Venturans who recently received Ph.D.'s.

August (Augie) Berger, jr., research scientist who will be moving to Nortronics Division with the Applied Research department next month, was recently awarded a Ph.D. in physics by the University of California at Berkeley.

His graduate studies, which began in 1948, were on nuclear magnetic resonance phenomena in liquid metals.

Gene Blount, chief of the Budgets and Controls group for the Technical department, was

Dr. Blount

Dr. Berger

awarded a Ph.D. in applied economics by the International University of Luxembourg. Dr. Blount was both a metallurgical and industrial engineer before turning to a career in finance.

Both men gave credit to Northrop educational assistance programs for their degrees.

When questioned on some of the major problems facing candidates for higher degrees, Dr. Berger expressed appreciation for the special help from Northrop Ventura.

"Even the most understanding faculty advisors have their own reputations and the reputation of their schools to protect," he said.

"Consequently, a person who asks to enter a part time research program leading to a doctorate while still employed full time elsewhere may get turned down."

Most doctoral applicants work on campus and undertake experimental programs under the full supervision of a faculty advisor, Dr. Berger added.

Dr. Blount encountered the same problem.

He learned through a friend that the International University of Luxembourg maintained a reputable graduate program that did not require full time resident studies for a doctorate so long as sufficient credits from other accredited schools were provided.

His application for support under provisions of Northrop's college refund program was accepted, and he began three years of part time studies at the University of Southern California to supplement his research in the field of economic planning and forecasting.

The University of Luxembourg

(See DOCTORS, page 6)

General Hamilton Howze, commander of U.N. Forces, Korea, inspects ROK F-5 (above), accompanied by U.S. Ambassador Winthrop G. Brown (center) and Northrop Senior Vice President Robert R. Miller. General Howze told listeners at last month's ceremony in Seoul that "the F-5 can match any jet aircraft in the world today." Mr. Miller (below) presents model of F-5 to Republic of Korea President Chung Hee Park.

Air Force personnel attached to U.N. Forces in Korea instruct ROK Air Force ground crews on maintenance of F-5 (below) while, at another plane in new Korean squadron, ROK pilots are checked out on controls (left).

NORTHROP FIGHTER WAS MET IN KOREA BY TOP U.S., ROK OFFICIALS WITH PUBLIC TESTIMONY OF F-5'S CAPABILITIES . . .

Northrop-built F-5's display ROK markings for first time.

. . . AND IN HAWAII, THE F-5B SET THE ENTIRE PACIFIC TALKING ABOUT VERSATILITY

Chatting between flights during Hawaiian F-5 demonstration tour are (above, from left) W. E. Woolwine, Bob Purcell, Monty Montgomery and J. A. Moise. Lieutenant General Tom S. Moorman (photo at right), vice CINCPAC, was one of 86 riders. At left, group waiting for John Fritz (in cockpit) to take off includes (from left): Dan Darnell, Colonel Gus Julian, Earle M. Jorgensen of Northrop Board, and Mr. Jorgensen's son, John.

AIAA Names 36 Technical Committees

The American Institute of Aeronautics and Astronautics has announced the appointment of new chairmen and members of 36 technical committees, which include seven Northrop employees.

At the same time Senior Vice President Richard E. Horner was named to the Technical Activities committee, which provides overall coordination of the technical committee programs. Mr. Horner is also national president of AIAA.

Win Arata of the Corporate Marketing staff, who has been nominated for chairman of the Los Angeles section of the AIAA, now heads the national Marine Systems committee.

Theo Knacke of Northrop Ventura's Paradynamics section is a charter member of the Aerodynamic Deceleration Systems committee, one of two new committees established this year. The other newcomer is History of Astronautics and Aeronautics.

Other Northrop appointees include:

—Robert E. Malm of Page Communications Engineers, Inc., named a member of the Communications committee.

—William B. Fallis of Norair, named a member of the Entry Vehicles committee.

—Norman P. Laverty of Nortronics, named a member of the Guidance and Control committee.

—Milton Beilock of Northrop Space Laboratories, named a member of the Spacecraft committee.

—Milt Kuska of Norair, named a member of the Management committee.

In its announcement of the appointments, the AIAA termed the 36 committees "the backbone of the AIAA" and added that "membership in them indicates the individual's eminence in his professional specialty."

NORTHROP NEWS

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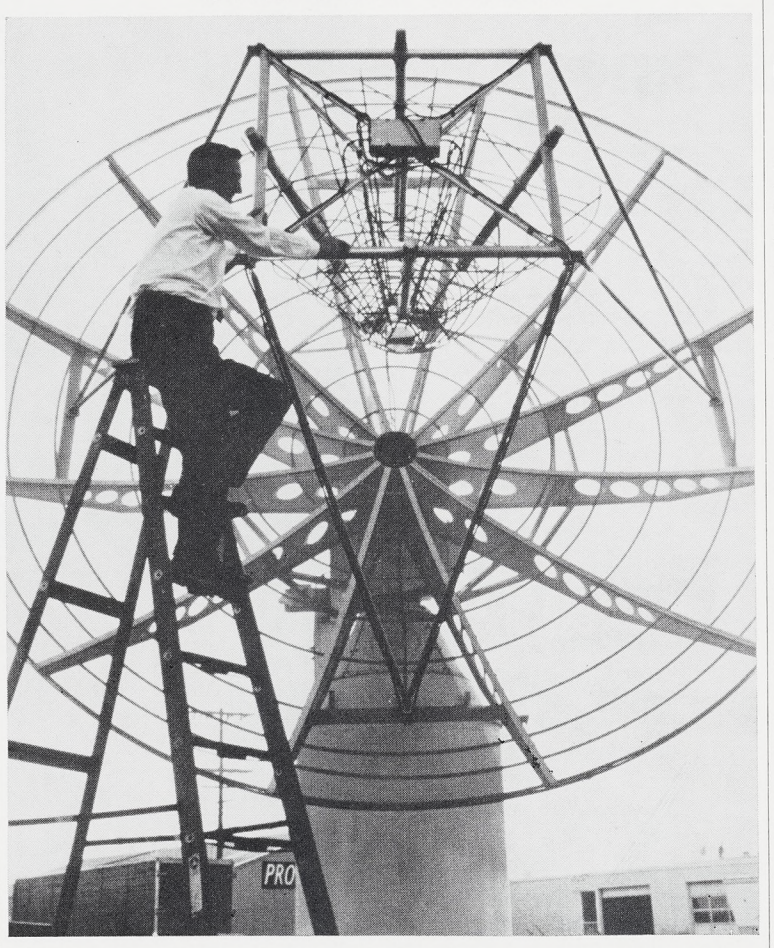
ONE FOR THREE



New tracking antenna that does the job of three is manufactured by Astro Technology Corporation, West Coast subsidiary of Page Communications, Inc. Astro Tech's vice president and chief engineer, Bob Smith, is making adjustments. Page is wholly-owned subsidiary of Northrop.

Medal of Honor Winner Revisits Scene of Heroism

"The last time I was through here the whole city was a deserted, smoking rubble," Ray Harvey said as he pointed to the sparkling clean, modern city, dotted with high rise offices and apartment buildings and bustling with 2.4 million people.

Mr. Harvey, of the Corporate Customer Relations staff, was in Seoul for ceremonies which officially made the Northrop F-5 a part of the Republic of Korea air defense.

He was also a special guest of the U.S. 7th Infantry Division in which he served during the Korean conflict.

Seoul was being leveled by Communist troops when Ray joined the 7th Infantry in 1950. When the Bayonet Division moved into the combat zone a few weeks later, he commanded C Company, 17th Infantry Regiment.

As the United Nations Forces pushed northward during the months of bitter fighting in 1950, Company C was the first American unit to reach the Yalu River.

But it was on the second U.N. drive in March 1951, near the 38th parallel, that Mr. Harvey was severely wounded in a hilltop action which earned him the Congressional Medal of Honor.

During his visit last month, he was honored at a special retreat and was made a lifetime member of the Society of the Bayonet Division. In touring Division facilities, Ray learned that an indoor shooting range had been dedicated to him and an officers' quarters (Harvey Hall) had been named after him.

Earning the Medal of Honor was both the climax and end of Mr. Harvey's combat career, even though he remained in the Army until 1961 when he retired as a lieutenant colonel.

He was commissioned in 1942 after graduating from Officers Candidate School and served through five campaigns in Europe during World War II.

Other decorations include the Distinguished Service Cross, Silver Star with two Oak Leaf Clusters, Bronze Star with one Oak Leaf Cluster, Purple Heart with two Oak Leaf Clusters, and the Chung-Mu Distinguished Service Cross with Gold Star awarded by the Korean Army.

HERO'S RETURN—Congressional Medal of Honor winner Ray Harvey, now a member of Northrop Customer Relations staff, reviewed troops and presented citations to members of 7th Infantry Division in Korea last month. Mr. Harvey served with 7th during Korean conflict.

Page Completes Pacific System

Page Communications has completed another communications installation for the U.S. Air Force ahead of schedule.

Ribbon cutting ceremonies were held recently in the Philippines by officers from Clark Air Base and Joseph A. Waldschmitt, president of the Northrop subsidiary.

As designers and managers of worldwide communications systems, Page has built networks which span the Pacific to bring Far East locations into instant contact with the United States and Europe.

Ham Operators Seek Global Northrop Net

Northrop Recreation Club ham radio operators, "in order to foster the Northrop family spirit," have taken steps to establish a worldwide communications network as a joint club project.

Employees of Ventura, Nortronics and Norair divisions, Northrop Space Laboratories and Page Communications Engineers, Inc., have responded to date.

Radio Club commissioner at Anaheim, Paul Staudenmayer, first presented the idea to clubs at Northrop Ventura and in the Hawthorne complex.

While Page Communications has no active club, it has ham operators in Washington, D.C., Hawaii, Midway, Guam, and throughout the Pacific where the Northrop subsidiary builds and maintains communications equipment.

The recently-organized club at Ventura has just installed equipment and is already making regular contact with Anaheim on a temporary schedule, according to Commissioner Bob Holly.

Hawthorne's Club is in the net through personal car radios, Commissioner Claude Moffett of Nortronics (Palos Verdes) said. Palos Verdes employees make up about half the membership of the Hawthorne Club.

In the absence of Club equipment, the Hawthorne group is concentrating at present on code classes and helping members build up their own sets, Mr. Moffett added.

"We have yet to work out operating times, frequencies or schedules," Mr. Staudenmayer said. "Our present emphasis is on locating and identifying Northrop amateurs."

One of the first steps proposed is the compiling of a Corporate-wide log carrying the names and call letters of all known amateurs. The log will be reproduced and distributed soon and updated periodically, he explained.

The net might also be used to handle personal messages from employees who are temporarily away from home on company business, Mr. Staudenmayer said.

Meanwhile, Mr. Staudenmayer would welcome information and comments by mail from interested amateurs. Or, the Club is on the air at Anaheim from 7:30 to 8 a.m. and from 11:30 a.m. to 12:30 p.m., Monday through Friday. Call letters are WA6YNT, operating on from 2 to 80 meters, mostly single sideband at 20 meters.

AF Cross Winner, Viet Nam Veteran Impressed By F-5

Lieutenant Colonel James R. "Robbie" Risner, one of the most distinguished U.S. Air Force pilots flying combat missions in Viet Nam, was a Norair visitor recently.

Colonel Risner spent most of two days in technical discussions with Norair officials. He also made two flights aboard an F-5B piloted from Edwards AFB by John Fritz, chief of Flight Programs, OPINDOC, and was reported to have been "very favorably impressed with the F-5 capabilities."

General J. P. McConnell, Air Force Chief of Staff, recently recalled Colonel Risner from Viet Nam to award him the Air Force Cross, second only to the Congressional Medal of Honor.

His award was for "extraordinary heroism" in leading an F-105 squadron against North Viet Nam targets despite the fact his aircraft was heavily damaged by anti-aircraft fire.

Colonel Risner was the cover subject on a recent (April 23) issue of Time magazine. He commands the Air Force's 67th "Fighting Cock" Tactical Fighter Squadron based at D'Anang.

He was credited with shooting down eight MIG's during the Korean conflict.

Venturan Graduates

Bernard W. Montag jr., Northrop Ventura controller, was among Los Angeles area businessmen completing the fourth annual Managerial Policy Institute in the USC Graduate School of Business Administration which ended May 10. Participants attended 30 weeks of evening classes.

HAM ON AIR—Marty Gregor (left) and Vaughn Peak of Nortronics (Anaheim) attempt contact with Northrop Ventura amateurs as first link in proposed Northrop-wide, worldwide communications net.

Northrop's Junior Achievers Profit From Taste of Business

It was a profitable year for the five Junior Achievement firms sponsored by Northrop divisions in 1964-65 even though, dollar-wise, not all were able to pay a dividend to shareholders. The profit to all came in the knowledge gained by the young participants as to how the American economic system really works.

As Rollie Pontious, Junior Achievement coordinator for the Norair Management Club, put it:

"As achievers come of age, they will guide the destiny of millions of future Americans . . . Their good judgment and wisdom will be needed in maintaining a prosperous nation."

Norair Management Club sponsored two firms this year. Nordesco, Inc., manufactured a pencil caddy; Norcraft, Inc., manufactured an emergency blinker light for stalled vehicles.

Conejo Designers and Producers, sponsored by Northrop Ventura made the top showing of the year among the five. The firm last month announced a 92 percent return on investment to shareholders, and was honored May 13 at the annual J-A banquet at Hollywood Palladium for placing fourth in competition for Company-of-the-Year in Southern California.

The words of Jeff Zizzi, president of Nortronics-sponsored Arbeit Company, are more repayment than Northrop counselors could ever receive elsewhere for their efforts.

In his message to stockholders, Jeff wrote:

"This year, although it was not as successful as planned, was successful in ways other than in money. The responsibilities, the procedures, and the organization of a company which we learned can be considered some of these ways. In addition we learned how the free enterprise system works."

In addition to Arbeit, which was sponsored by Hawthorne personnel, Nortronics counselled Descal, Inc., at Anaheim.

EXECUTIVES MEET—Carol Grassman (left), one of 18 Junior Achievement presidents interviewed at Corporate offices last month, signs in with Elizabeth Johnson, Northrop receptionist. J-A leaders were vying for annual Executive Awards.

Nolan Backs J-A as Boon To Free Enterprise System

Hundreds of Southland business and professional people are devoting thousands of hours of their own time each year to the Junior Achievement program because, as Senior Vice President Dick Nolan put it this week, "they believe it is one of the best ways to instill enthusiasm for the free enterprise system in young people."

Mr. Nolan's statement was made on behalf of a panel of nine judges which met last month at the Corporate offices in Beverly Hills to present 14 Executive Awards to the top teenage business men and women in Southern California.

Mr. Nolan was host to the group and chairman of the meeting, which involved individual interviews of finalists to determine how well the young candidates had learned to cope with the complexities of modern business.

Executive Awards are made annually at the conclusion of the Junior Achievement year, which runs from October to May. J-A firms are liquidated each spring with profits disbursed to shareholders.

According to Mr. Nolan, himself a seven-year J-A veteran, the awards were based on what the young people learned about free enterprise rather than whether the firm showed a profit or loss for the year.

"It was a most refreshing experience to take time out from the complexities of modern business and see the younger generation come to grips at an early age with the free enterprise system," he said.

"So often, young people come into the business world with a good education in theory but have no concept of the reality. The exposure to business realities through the J-A program is one of the best defenses against communism that we have today.

"J-A promotes understanding and creates interest in free enterprise, as well as providing a basic education in what makes our nation's economy tick."

The panel was exposed to some unexpected business realities of its own during the interviews.

Each of the candidates sub-

(See NOLAN, page 5)

SAY, THAT LOOKS LIKE MINE

Major General Clyde Box, USAF (left), commander of Sixth Allied Tactical Air Force, Izmir, Turkey, and Admiral Charles D. Griffin, USN, commander-in-chief, Allied Forces Southern Europe, Naples, Italy, compare F-5 models during the Admiral's recent visit to NATO headquarters in Turkey. Both Greece and Turkey are scheduled to receive F-5's which will support NATO operations in southeastern Europe.

ANAHEIM SHOW TO ATTRACT PETS FROM ALL WALKS OF LIFE

If it walks, crawls, plods, prances, glides or slithers, bring it along June 13 when Nortronics (Anaheim) NRC holds its annual pet show at 2 p.m.

The big event will be held in the NRC area and is open to all Northrop employees and their families.

And the public is invited to attend free.

Trophies and ribbons will be presented in eight categories, including cats, dogs, hoofed animals, fish, birds, and novelty pets. There will be a best-of-show judging and each entry will receive an award.

The Southern California Humane Society will provide judges.

This annual event is traditionally one of NRC's most interesting affairs of the year for both contestants and spectators.

PIONEERS IN PARADYNAMICS: PART I

Slender Thread of Life Is Silken Line

Parachutist extraordinaire Lew Vinson has only one of his nine lives left, so after 24 years and 1090 jumps he's sticking to the ground.

But his life is still hooked to the slender threads of a canopy.

As parachute field test representative for Northrop Ventura, his assignments range from setting up tests at El Centro, California, of Gemini escape systems to fitting astronauts for their personal parachute harnesses.

As for the nine lives, Lew relates that his main chute has malfunctioned seven times since his first jump in 1943. Each time his emergency pack opened at the last minute. On jump 1088 he broke his leg in a rough landing.

To call Lew a pioneer in paradynamics is an understatement. When he retired from the Navy in 1957 as a chief warrant officer, this was a sampling of his record:

—Most jumps in Naval air history which dates to 1911.

—First to test completely automatic aircraft ejection seat.

—With the first group of Navy men to jump from above breathing and subzero temperature height, to test pressure suit. Experiment involved free fall from 32,000 feet to breathing altitude.

—Personally made 755 experimental jumps in research, development, testing and evaluation of pilot safety and survival equipment.

When he joined Northrop in 1957, he went to work on another first—testing the Skysail parachute. Skysail was the first personnel parachute designed and developed for the U.S. Navy by private industry.

Three years later, with the record books still filled with the name Carpenter L. T. Vinson, the fun really began for Lew as he added another chapter to the history of Naval aviation.

He volunteered to return to active duty for organizing training and leading the Chuting Stars, a skydiving team which, in 1961, performed at 41 major air shows in the U.S. and Canada to commemorate the 50th anniversary of Naval aviation.

Performing for crowds too far below to see, the Chuting Stars jumped from 12,500 feet, passed batons or performed acrobatics while falling at 120 miles per hour, and then pulled the ripcord at 2500 feet.

Not only did the Chuting Stars give a special performance for President Kennedy and top Washington officials at Andrews Air Force Base near Washington, they put on a show only a mile from Northrop Ventura at Rancho Conejo Airport.

While there were only 41 air shows, which also featured the Blue Angels, Lew added 265 jumps to his record, counting the training period.

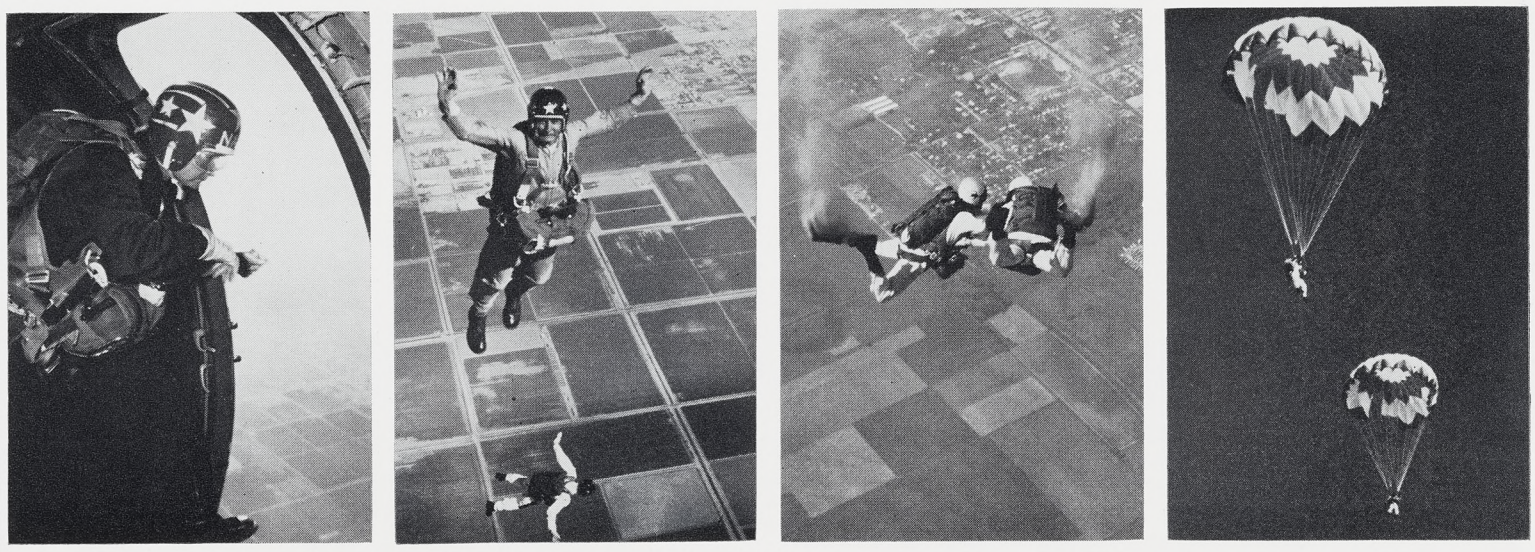
With more than 1000 jumps to keep track of, you might think Lew would have trouble remembering the toughest one. But he will immediately answer: "number 417."

That's because number 416 was three seconds away from being his last, and "it's always hardest to go back up after you've had a close call."

It was in 1952 when Lew was testing a new piece of equipment that his main chute opened, but "streamed," which means it did not inflate with air.

He opened his emergency chute but it got entangled with the main suspension lines.

(See VINSON, page 5)



Chuting Star Jumpmaster Lew Vinson makes like a falling star.

VINSON

(Continued from Page 4)

He was still plummeting at full speed and at less than 1000 feet when he finally worked the reserve chute loose. He came out of that drop unhurt, but he doesn't care to take credit for the fastest 12,000 foot jump.

That same year, while stationed at El Centro, Lew earned the Air Medal for organizing and leading a rescue mission to take medical assistance to a Marine aircraft crew downed on a virtually inaccessible mountainside.

He was decorated again in 1957 for rescuing a helicopter crewman downed at sea.

But Lew's experiences have not all been so somber.

There was the time in Canada when the Chuting Stars were to perform at the Canadian National Exhibition. As usual, the group submitted a list of their requirements to the sponsors.

An unusual addition to this list, however, was a request to have a laundramat open all night for their use. It seems the program called for jumps into Lake Ontario on two successive days.

Since it takes two to three days for a parachute to dry normally, they had to run a whole fleet of automatic dryers most of the first night in order to have dry packs for the next day's show.

The Canadian sponsors almost had to cancel the show, but finally were able to make the necessary arrangements.

When the 1961 tour was over for the Chuting Stars, Lew returned to Northrop Ventura.

For a paradynamics pioneer whose record shows two retirements and more than his share of contributions to pilot safety, Lew is showing no signs of slowing down.

His mind is virtually a databank of paradynamics and his every decision reflects the horsesense that only 24 years and 1090 jumps can develop.

Lew Vinson is one good reason why astronauts in the Mercury and Gemini programs who have been up and came back safely will never forget Northrop Ventura.

NOLAN

(Continued from Page 4)

mitted a written treatise on the year's activities. As a part of the treatise, candidates were required to describe the organization and operation of a hypothetical company.

One crewcut candidate described his hypothetical company as one that produced and sold tropical fish. Complying with treatise format, as outlined by J-A, the candidate penned a classical answer to the requirement to describe the production control department of the make-believe company.

"We didn't have a production control department," he wrote. "There was only so much we could do. Most of it was up to the fish."

He became one of the 14 Executive Award winners.

WEATHER NOT CAUSE

Fog, rain and snow were not major causes of highway accidents in 1964 that claimed 48,000 lives. About 90% of the crashes occurred in clear weather on dry roads, according to an authoritative survey just released by The Travelers Insurance Companies.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Refrigerator, Philco, sep. freezer space, 2 crispers & meat storage drwr., $75. Hawthorne, OS 6-1404. A

Power Mower, King-O-Lawn, $150. Inglewood, 675-0521. A

Sewing Machine, in desk-style cabinet, Dial-A-Stitch control, 3-yrs-old, $100. Inglewood, 677-4540. A

Bicycle, full-size, boy's, hand brakes, 3-spd. Sturmy-Archer, $25, W.L.A., GR 2-2818. A

Range, 4-burner Vista w/Robert Shaw oven, $20. Torrance, 835-3985. A

Bar Stool Set, woven straw seats, metal legs, $30. Manhattan Bch., 379-4775. A

Chevrolet, 1957, new tires & battery, $675. Fullerton, 528-6914. A

Austin Healey, 1958, 4-seater, $850. Manhattan Bch., 379-6442. A

Chevrolet Impala, 1958, 2-dr. h/top, 348 eng., p/s, $550. Gardena, DA 4-0158. A

Volkswagen Camper, 1963, w/tent & stove, 1500 eng., $1750. Inglewood, OR 4-1654. A

Corvette, 1957, hard & soft tops, cam, solids, 4:56 rear end, 57,000 miles, $1300. Manhattan Bch., 371-3436, 372-2336. A

Dishwasher, Mobile Maid, coppertone, 7-mos-old, $100. Torrance, FA 0-1897. A

Cemetery Lot, singles, Sunrise plot, $450. Inglewood, 674-5579. A

Chevrolet Station Wagon, 9-pass., p/b, p/s, p/w, r/h, V-8 eng., $850. Buena Pk., LA 1-4711. A

Dress, formals & cocktail-type, sizes 8 & 10, $10-$15. Manhattan Bch., 374-3881. A

Car Cooler, evaporation floor-type, plugs in cig. lighter, 12 volt, $20. Manhattan Bch., FR 2-6916. A

Buick Electra 225, 1960, 1-owner, many extras, $1095. Inglewood, 679-5979, 672-0312. A

Camera, 4x5 Crown Graphic w/flash gun & solenoid, $125. Hawthorne, OS 5-3866. A

TR-3 Triumph, 1957, needs work, $500. Anaheim, PR 6-2578. A

Table Set, cafeteria-type, masonite tops, $15. Gardena, DA 9-7447. A

C-B Radio, Olson spotter 3, tuneable 23 channels, transmit channels 1, 3, 9, 17, 3-mos-old, mobile ant., $110. Huntington Bch., 714-847-5029. A

House, 2-bdrm., dble. gar., corner lot, sprinkler sys., used brick veneer & planters, remodeled, R-2 zone, 2 blocks from Alondra Park golf course, $17,750. Gardena, 371-6871. A

House, 3-bdrm., 1½-bath, lge. backyard w/ fruit trees, redwood fence, patio w/brick bbq., $17,900. Buena Pk., 828-4388. A

Corvair Monza, 1962, 4-dr., auto., r/h, b/ seats, $1050. Inglewood, OR 7-7364. A

Pups, boxer, AKC, 8-wks-old, fawn & white, $100. Cypress, 714-827-4393. A

T-Bird, 1958 h/top, p/s, p/b, $695. Torrance, DA 9-3286. A

Property, 29 Palms area, 5 acres & cabin w/electricity, fully insulated, $3000. P. V. Pen., FR 8-3448. A

Mobile Home, 10'x50', 2-bdrm., furn., air cond., $2995. Orange, KE 2-1361. A

Plymouth Station Wagon, 1959, 6-pass., push-button dr., $400. Anaheim, 635-1686. A

Trailer, single-wheel, 18.8 cu. ft., covered, hitches & spare tire, 6-volt lights, $100. Santa Monica, EX 4-3345. A

Plymouth Club Coupe, Belvedere, 1955, auto. trans., r/h, $150. Torrance, FA 8-6839. A

Falcon, 1960 2-dr. station wagon, stick, r/h, $550. Redondo Bch., FR 4-2188. A

Table, solid oak, 54" round, w/4 straight-back chairs, $65. Canoga Pk., DI 0-7752. A

Wig, hand-tied, shoulder lgth., auburn, $75. Garden Grove, 714-897-5647. A

Sunbeam Rapier, 1956 deluxe sedan, o/drive, $250. Torrance, FR 4-7987. A

Porsche Roadster 1600S, 1961, $2595. Box 801. A

Organ, Gulbransen Rialto, theatre model, walnut finish, 6-mos-old, $3800. Lomita, 326-6074. A

Chevrolet Impala, 1958, p/s, p/b, V-8, r/h, 2 new tires & battery, $595. Placentia, 528-2166. A

Sprite, 1961, w/radio, tonneau cover, 4-spd. trans., $825. Box 802. A

Corvair Monza 900, 1961, r/h, auto. trans., $925. Box 803. A

T-Bird, 1964, air cond., p/b, p/s, w/w, reclining right seat, auto. trans., $3950. P. V. Pen., FR 7-1466. A

Washer, RCA Whirlpool, $75. Redondo Bch., 372-9757. A

Dryer, Norge deluxe, 14-lb. cap., $150. Fullerton, 349-6330. A

For Sale

Ford Victoria, 1956, 2-dr. h/top, new tires & brakes, $350. Redondo Bch., FR 4-2915. A

Wig, machine-made, blonde frosted, 100% human European hair, 2-mos-old, $80. Inglewood, OR 3-5568. A

Accordion, La Scalla, 120 bass, 7 shifts, 10-mos-old, $300. Lawndale, OS 5-5780. A

Guitar, elec., Gibson, Spanish-type, pen-striped, $125. Inglewood, 757-6960. A

Volkswagen 1500, 1964 2-dr. sedan, 3000 miles, $2200. Hawthorne, OS 6-8816. A

Chevrolet Truck, 1960 ¾-ton, 10' Tuk-A-Way telescopic camper, hand-operated, $1600. Hawthorne, OS 6-8331. A

Surfboard, 8½', glass-covered balsa, $25. Manhattan Bch., 372-6603. A

Piano, apt-size spinet, Wurlitzer, walnut, $250. Gardena, DA 4-9033. A

Corvair Monza, 1962 4-dr., b/s, r/h, 1-owner, $1025. Alhambra, AT 4-5698. A

TV, Zenith console, about 10-yrs-old, $15. Inglewood, 672-5578. A

Motor Scooter, 3-wheel, 2½ hp B & S eng., $100. Rolling Hills Est., FR 5-8536. A

Range, O'Keefe & Merritt, 4-burner, griddle & broiler, gas, $60. Torrance, FR 1-2381. A

Chevrolet Impala, 1959 sedan, p/s, p/b, r/h, auto. trans., good tires, $700. L.A. 645-7276. A

Refrigerator, Crosley Shelvador, 9.5 cu. ft., auto. defrost, 50-lb. freezer, $50. L.A. 45, 670-2564. A

Pup, Irish setter, female, 7-mos-old, AKC reg., champ. stock, $100. Palmdale, 805-947-7867. A

Textbook, Business Data Processing & Programming by Gregory, used 1 semester, $4. Hawthorne, OS 5-6285. A

Ford Fairlane, 1957, conv., auto., new top & w/s/w tires, p/s, p/b, r/h, $400. P.V. Pen., 377-5084. A

TV, Motorola console, 21", $35. Hawthorne, OS 6-8842. A

Surfboard, Hobie, 9' 2"x22" w/T-band & ¼" rail stringer, $85. Downey, 861-6133. A

Pups, boxer, pedigreed, avail. about July 1, $50. L.A. 670-5627. A

Freezer, upright, 6', 3-yrs-old, $150. Hawthorne, OS 6-6847. A

Mercury Montclair, 1957 2-dr. h/top, 368 Turnpike Cruiser eng., 47,000 miles, $350. Redondo Bch., DA 6-7745. A

Refrigerator, white, 11 cu. ft., Frigidaire, crosstop freezer w/pullout shelf & meat tender, $140. Torrance, FR 1-3769. A

Home, 4-bdrm., 2-bath, custom decorated, landscaped, sprinklers, Spanish tile, 25' gar., less than 3-yrs-old, GI resale, furn. or unfurn., $31,950 furn. San Pedro, TE 3-6037. A

Ford, 1956 6-pass. station wagon, V-8 stick, o/drive, r/h, new clutch, valves & rings, $150. Gardena, 675-4267. A

French Poodle, toy, 7-wks-old, female, black, AKC reg., $50. Norwalk, 684-7673. A

Freezer, 10 cu. ft., chest-type, $30. Inglewood, OR 2-8629. A

Mattress & box spring, full size, $35. Torrance, DA 9-3721. A

Own-Your-Own Apt., near new, 2-bdrms, 2 baths, pool, hobby & party rms., $20,500. Gardena, DA 3-2350. A

Go-Cart, new chassis & eng., never used, requires completion, $75. L.A., GR 6-1635. A

Drums, complete set, Ludwig, sparkle blue, $350. Moorpark, 805-529-1285. A

Gym Set, has 2 swings, glide ride, trapeze bar & gym rings, $10. Inglewood, PL 5-7521.

Bedroom Set, 6-pc., blonde, $80. Gardena, DA 4-4625. A

Refrigerator, Marquette, dble. door, upright, 10 cu. ft., 12 cu. ft. freezer, $150. Gardena, DA 4-0649. A

Engine, Renault Dauphine, complete assembly w/radiator, generator, starter, air filter, rebuilt, painted, mounted on stand, $195. Encino, 788-0883. A

Plymouth custom Suburban, 1958, new brakes, major eng. tuneup, $250. San Pedro, 831-9589. A

Sofa, 3-pc. curved sectional, brown w/silver threads, Goodyear foam rubber, rev. cushions, $75. Long Beach, GA 6-4709. A

Bicycle, racing-type, boy's 12-spd. Campagnolo Derailleur, rat trap pedals, water bottle, $35. P.V. Pen., FR 8-2810. A

Pontiac Catalina, 1963, 2-dr. h/top, air cond., p/s, p/b, r/h, auto. trans., $2300. Hawthorne, 675-7027. A

Ford station wagon, 1957, r/h, p/s, $250. Gardena, DA 4-7209. A

Chevrolet Sedan, 1956, Powerglide, $400. Long Beach, GA 3-1363. A

Ford, 1958, V-8 auto, rebuilt motor, new tires & battery, hvy. duty shocks, $275. Hawthorne, 751-2979. A

Mercury, 1946, 2-dr., $125. Torrance, 326-2932. A

Chevrolet, 1957, Bel Air, 2-dr., h/top, new trans., tires, int., $700. Hawthorne, 371-0194. A

Falcon, 1960, 4-dr. sed., auto. trans., r/h, w/w tires, $495. Torrance, DA 5-3724. A

Patio Awning, 9 x 14 aluminum, still in box, $175. Huntington Pk., 589-9503. A

Camper, 8' cabover, ash int., butane stove w/oven control & refrigerator, $895. Gardena, OS 6-3726. A

Corvair Monza, 1963 conv., auto. trans., r/h, $1295. Torrance, 324-8397. A

For Sale

Volkswagen, 1955, sunroof, 1961 eng., 28 mpg, $450. L.A. 291-7715. A

Yawl, 28', Grey-Marine 22½ hp aux., SS rigging, running lights, req. CC equip., 8' plywood dinghy, $2500. Long Bch., 438-5579.

House, contemporary custom-built tri-level, 3-bdrm. & conv. den, city & harbor view, stable pad, trees, sprinklers & low maint. yd., $47,900. Eastview, TE 3-9862. A

Table, antique dropleaf, $47.50. L.A. 47, 755-6301. A

Mobile Home, 1960 10x50 Golden State, 1-bdrm., awning, 8x20 rollup cabana, 8x16 porch, cooler, $5900. Torrance, TE 5-3547. A

Sectional, 2 pc., aqua, lamps & bathroom sink, $40. Inglewood, OS 6-1475. A

Clarinet, Conn, $50. L.A., 755-6301. A

Volkswagen, 1964, 17,000 miles, $1500. Thousand Oaks, 805-495-9410. A

Ice Box, 18"x48"x24", $10. Torrance, FA 8-3306. A

Volkswagen, 1961 sedan, w/w, radio, $1000. Inglewood, OR 2-1835. A

Porsche 1500, 1955 speedster conv., new top, good tires, take over $43 mo. pymts., $633 bal. Inglewood, 674-5223. A

Bicycle, boy's 20", $15. Inglewood, PL 5-4497. A

Turntable, Miracord X-200, 4-spd. w/magic spindles, diamond cartridges for mono & stereo, $75. Torrance, DA 3-6745. A

Car Trailer, suitable to carry light vehicles, $125. Bellflower, 867-1476. A

Ford, Country sedan station wagon, 1957, $495. San Pedro, 547-3490. A

Ring, ladies' diamond dinner-type, $75. Hawthorne, 676-4236. A

Dinette Set, Virtue Bros., hutch & buffet, charcoal, 4 pink uphol. chairs, $100. L.A., PL 4-2702. A

Bedroom Set, traditional walnut, dble. bed, dresser, chest, vanity, nightstand, 2 mirrors, mattress & spring, $150. Inglewood, OR 1-3860. A

Honda, 305 Dream, 1964, $475. Redondo Bch., FR 6-4829. A

Ford, 1954 2-dr., V-8 deluxe, $100. Gardena, OS 5-2159. A

Boat, 18' fiberglass Overnighter, 60 hp, w/ trailer, new bait tank w/pump, many extras, $1350. San Pedro, 833-9165. A

Wristwatch, Omega Seamaster, auto., yellow gold, luminous & waterproof w/Omega leather band, $90. L.A., 464-6730. A

Chevrolet, 1956, V-8 4-dr. station wagon, auto. trans., r/h, o/hauled, trailer hitch, $350. P. V. Est., 375-7168. A

Wanted to Buy

Camper Jacks & pickup side view mirrors, sets of each. Torrance, DA 4-7623. B

Bicycle, ladies', good mechanical cond., hand brake or variable spd. control not necessary. Inglewood, 671-2170. B

Steel Guitar, Hawaiian, single neck w/amplifier. Lynwood, NE 1-9322. B

FREE (To Be Given Away)

Pups, cocker-poodle-beagle, black or brown w/white, avail. around 1st week of June. San Pedro, TE 3-4191. D

Pup, part cocker & part poodle, 7-mos-old, 13" high, house broken. Lawndale, 769-4269. D

Kittens, 4. Torrance, FR 1-1000. D

Rentals Offered

Unit, owner's, 1800 sq. ft., 3-bdrm., 3-bath, family rm., fireplace, pvt. deck & 3-car subterranean gar. w/storage, built-in kitchen, soft water system, adults, $265 lease. Redondo Bch., 373-1143. E

Apt, 2-bdrm., 2-bath, walk-in closets, pvt. patio, carport, $145 mo. Hawthorne, 839-5086. E

Apt, 1-bdrm., deluxe, built-ins, unfurn., $87.50 mo., Hawthorne, 676-2481. E

Sleeping Rooms, linen furn., single, $15 wk., double, $12.50 ea. wk. Lawndale, 371-6775. E

Studio Apt, unfurn., 2-bdrm., 1½-bath, tile kitchen & bath, hot water furn., walk to Norair, 1 child ok, $125 mo. Hawthorne, 679-0622. E

Cabin, Lake Arrowhead, near lake & village, all utilities, sleeps 6, $50 wk. Manhattan Bch., 379-2504. E

House, 1-bdrm., garage, $95 mo. Inglewood, OR 7-5709. E

Apt, 1-bdrm., furn. & unfurn., heated swimming pool 18'x40', no children or pets, 1 blk. to Gardena Valley shopping center, $110-$125. Gardena, 327-4791. E

Apt, 2-bdrm., near Northrop, partly furn., $80 mo. Inglewood, PL 4-1611. E

House, 3-bdrm., 1¾-bath, dishwasher & refrigerator, fireplace, 2-car gar., fenced backyard, 1½ blocks to Hawthorne High, avail. July 1, $165 mo. Hawthorne, OS 6-2846. E

House, 1-bdrm., small furn., utilities pd., close to Northrop, $90. Hawthorne, 676-0787. E

Apt, deluxe, 1-bdrm., built-ins, pool, $90 mo. Redondo Bch., 376-2117. E

Cabin, Green Valley Lake, $35 weekend, $65 week. Torrance, 320-2002. E

Apt, 2-3 bdrm., unfurn., exec-type, closed gar., 1 block to Northrop, $130-$160 mo. Hawthorne, 676-9620. E

Apt, 2 king-size bdrms., unfurn., pool, built-ins, $125 mo. Torrance, 323-1946. E

Owner's Apt., 4-bdrm., lower duplex, 1-yr.-old, 1¾ baths, lge. backyard, 2 blocks to school, walk to Centinela Park, lease, $195 mo. Inglewood, 673-4274. E

Personals

RETIREMENTS

The following individuals have recently retired from active service with Northrop Norair:

BATES—Edmond E., Quality Control. Seniority date, August 1, 1951. Retired March 1, 1965.

BECKER—Charles H., Tool Design and Fabrication. Seniority date, March 18, 1941. Retired June 1, 1965.

CHRISTY—Clarence C., Machine Maintenance. Seniority date, August 22, 1947. Retired May 1, 1965.

HARRELSON—Mrs. Madge L., Plumbing and Mechanical Assembly. Seniority date, October 13, 1953. Retired April 1, 1965.

JOHNSON—Mrs. Kathleen S., Graphic Services. Seniority date, November 30, 1951. Retired May 1, 1965.

KIDD—Nolan E., Tool Design subunit. Seniority date, January 7, 1941. Retired May 1, 1965.

MC AULIFFE—John F., Field Construction. Seniority date, July 19, 1954. Retired March 1, 1965.

MC MANUS—James B., Timekeeping. Seniority date, November 10, 1953. Retired June 1, 1965.

RICHARDSON—Joseph A., Materiel Coordination unit. Seniority date, February 15, 1940. Retired April 1, 1965.

ROBERT—Jonathan L., Advanced Production & Weld. Seniority date, September 22, 1958. Retired April 1, 1965.

SCHOETTLIN—Mrs. Tommie H., Telephone and Telegraph. Seniority date, September 22, 1949. Retired April 1, 1965.

SCOTT—Wiley W., Food Services unit. Seniority date, October 21, 1947. Retired May 1, 1965.

TUCKER—Mrs. Virginia L., Boundary Layer Research. Seniority date, May 3, 1948. Retired March 1, 1965.

I wish to thank all my wonderful friends for the help during my recent illness. No words can express my appreciation. My deepest gratitude to all of you for your kindness. GLORIA J. SKOK. L

Rentals Offered

Home, Camarillo Heights, 4-bdrm., family rm., split-level, patio, landscaped, yard care, $345 mo. Camarillo, 805-482-1004. E

Apt., 2-bdrm. deluxe, furn., lge. rooms, sep. dining area, 4 blocks from Norair, utilities pd., $125 mo. San Pedro, TE 3-2512. E

Apt., deluxe 2-bdrm., lge. pool, all extras, closed gar., near El Camino Col., $115. Torrance, DA 9-5986. E

Apt, 2-bdrm., 2-bath, all built-ins, fireplace, free hot water, unfurn., near Norair, $135 mo. Hawthorne, 679-1358. E

Apt, 1-bdrm., unfurn., $120; furn., $135; 2-bdrm., 2-bath, unfurn., $150; furn., $170. Inglewood, 671-0835. E

Apt, furn., bachelor-type, for single man, utilities paid, $55. Hawthorne, OS 6-5921. E

Apt, 2-bdrm., furn., fireplace, pvt. patio, ocean view, $150. Hermosa Bch., 372-5808. E

Apt, 1 & 2-bdrm., all elec., on Hawthorne Blvd., $85-$125. Torrance, 375-9397. E

Rentals Wanted

House, 2-3 bdrm., unfurn., in Hawthorne or Gardena. Hawthorne, 676-8581. F

For Sale or Trade

Rambler American, 1959, 2-dr., new paint & interior, o/hauled auto. trans., $450 or trade for Morris Minor, 1961, 2-dr., in good condition. San Pedro, TE 3-9455. M

Rifle, 30-30 Marlin, 1964, model 336 micro-groove, $50 or trade for a comparably new 9x12 heavy canvas tent. Redondo Bch., 379-3781. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Rosecrans & Normandie, Gardena. Pat Threlkeld, ext. 1860, 327-2323. 2

7:30 a.m. — 4:15 p.m.

Yukon & 154th, Lawndale. Sandra Joyce Gostel, ext. 1435, 679-4269. 3

La Cienega & El Segundo Blvd. or 120th St. & Isis Ave., Hawthorne. Penny Prouty, ext. 1458, OS 6-1296. 3

Alma & W. 24th St., Manhattan Beach, L. Berg, ext. 2763, 627-5578. 3

8 a.m. — 4:45 p.m.

Pacific Coast Hwy. & Ave. E or P. V. Blvd., Redondo. Bonnie Condon, ext. 617, 375-3744. 5

Santa Monica Area to Anaheim, Pacific Palisades. Alfred Weiss, ext. 1020, GL 4-9356. 5

Hawthorne & Pacific Coast Hwy., Torrance. Annette Adam, tie line 29-532, 375-9397. 5

Rides Offered

8 a.m. — 4:45 p.m.

Santa Monica Area to Anaheim, Pacific Palisades. Alfred Weiss, ext. 1020, GL 4-9356. 15

Ventura Exceeds Suggestion Goals By Healthy Margin

Northrop Ventura has put in a claim for the corporate-wide record for the most employee suggestions received in a two-week period, as a result of 160 responses last month to an Employees Suggestion Award program campaign.

The Suggestion Award committee had set a goal of 150 money-saving ideas for the two weeks. Engraved cigarette lighters were given to each participant—regardless of whether or not the suggestion was accepted—in order to stimulate a widespread interest in the program.

The committee reported this week that every department provided "outstanding support" of the special campaign, and every area of Northrop Ventura activity was represented.

This year's "suggestion special" showed an increase of 60 percent in participation over last year.

A drawing is being held this week for tickets to 10 Los Angeles baseball games, with each of the 160 participants eligible to win.

SPEED: NO. 1 KILLER

A recent study shows that excessive speed continues to be the number one killer on American highways. Speed was involved in about 35% of the accidents which killed 48,000 persons in 1964.

DOCTORS

(Continued from page 1)

provided course work guidelines and also set the theme for Dr. Blount's thesis on the philosophical foundations of economics.

A representative of the European school met with Gene during a visit to the United States. He conducted an oral examination, verified Gene's identity through photos, birth certificate and transcripts, and evaluated all previous academic work performed.

Engineer Jim Raymond, who also is a member of the Ventura Research group, found another solution to the problem, but his situation is a rare exception.

Mr. Raymond has just been informed that his thesis on a method of representing transistor behavior has been approved by UCLA for a master's degree in engineering.

Shortly after his research proposal was accepted by UCLA, Northrop Ventura received a contract from the Defense Atomic Support Agency to develop such a technique.

Jim found himself working on a contract directly related to his graduate studies which, he points out, is also being supported by the college refund benefit at Ventura Division.

MERCY

(Continued from page 1)

Salt Lake City, Utah.

A hurry-up call went out to Ent AFB, Colorado, requesting Air Force assistance.

Major Thomas L. Titus of Williams AFB, Arizona, who was at Ent AFB in a T-38 for a special training mission, volunteered to fly the mission.

He flew to Salt Lake City and back to Ent AFB where a waiting Army helicopter shuttled the precious vaccine to Fort Carson.

WILL SUCCESS SPOIL ACHIEVERS?—Cheryl Polen, vice president-Sales for Conejo Designers and Producers, demonstrates emergency flare kit, which proved so successful that firm, sponsored by Northrop Ventura, declared 92 percent dividend to shareholders this month before liquidating.

J-A SHAREHOLDERS EARN 92%; FIRM WINS SOUTHLAND HONOR

Conejo Designers and Producers, a Junior Achievement firm sponsored by Northrop Ventura, last week announced a 10 percent dividend and 82 cents per share return of surplus for 1965.

At the same time the firm announced its liquidation and was awarded fourth place in competition for Company of the Year in Southern California. There were 182 firms competing.

The firm sold 100 shares at one dollar each last October when the company was started with the help of Ventura Division.

Production and sales of emergency flare kits were so successful that the company this month gave maximum commissions and bonuses to employees and executives under guidelines set by the Southern California Junior Achievement organization.

For the last month of operation it voted raises of 60 cents an hour (to 80 cents) to hourly workers and six dollars a month (to eight dollars) to executives.

Shareholders were then voted what amounts to a 92 percent cash dividend.

As one of the top four companies in Southern California, Conejo Designers was honored at a banquet May 13 at the Hollywood Palladium.

Firms were judged by the Junior Chamber of Commerce on the basis of performance in organizing, managing, financing, manufacturing, and marketing their products.

GAGE TOPS GRIZEL IN COMMUTER RACE

Hold on there Leo Grizel, Walter Gage has almost doubled that commuter record you would like to claim.

Nortronics' Mr. Grizel has commuted 196,000 in working for Northrop and thought it might be a record.

Now comes Walt Gage, Northrop Credit Union's popular treasurer, who's logged 384,700 miles.

Can anyone top that?

Carrol to Speak

Bob Carroll, assistant program manager—Apollo, Space and Information Systems Division, North American Aviation, will be principal speaker June 23 for the Northrop Ventura Management Club.

Babcock Jr. to Join 'The Long Gray Line'

Systems Engineer Ed Babcock of Northrop Space Laboratories (Huntsville) has announced that his son, Ed jr., has received a congressional appointment to the U.S. Military Academy at West Point.

Northrop and Moore Patent Blanket for Astronauts

Ray Moore has invented a novel and practical accessory for use in extended space flights of the future and Northrop Corporation has patented the idea.

Mr. Moore's "Zero G Restraint Blanket" strikes at the heart of two potential problems—keeping the astronaut in bed for needed sleep and providing an air of "something from home," filling a psychological need.

Staying in bed is a major problem, since weightlessness causes objects, including astronauts, to float free unless secured. Zero G also eliminates the need for such things as pillows and mattresses.

Mr. Moore has designed a lightweight blanket through which many small plastic tubes run at intervals, end to end. Each contains hundreds of small holes. Air from the spacecraft's environmental control system is routed through the tubes and out the holes, creating light pressures sufficient to hold the blanket in place. Small lines at each corner restrain the covering.

Requests for patent rights were submitted in 1961 when Mr. Moore was supervisor of Systems Integration at Northrop Space Laboratories. A patent was issued last month.

Now a Norair engineering specialist, Mr. Moore sees other possibilities for his idea. For instance, "sandwich-style" sleeping arrangements to conserve space.

"Since there is no recognized up or down in space, two men with these blankets could sleep back-to-back on almost any surface," he reasons.

Queries received since the patent was issued indicate others see some promise in the idea. One blanket manufacturer would like to turn them out, and scientific publications are clamoring for more information.

RADIO NET

Mat Tennyson of Northrop Ventura Radio Club discusses new equipment recently installed by club with other amateurs. NVRC is cooperating in Nortronics move to establish Corporate-wide net (story on page 3).

4 MILLION INJURED

More than 3,840,000 persons sustained injuries in automobile accidents last year. Driver error and lack of judgement were responsible for more than 85% of the highway casualties in 1964.

Ventura Recreation Club Good Time Table

For enrollment or information on activities listed below, call or contact Recreation Club, Ventura, ext. 480.

ARCHERY, Dale Milligan
Meet 1st Sunday, 10 a.m., Balboa Park Recreation area, Encino. Beginners with or without equipment welcome to free instruction.

BOAT, Gus Johnson
Meet 1st Thursday, 7:30 p.m. DAV Hall, 6543 Corbin Ave., Reseda.

BOWLING, Zack Silvers
Teams compete in mixed leagues on Thursday evenings at Conejo Bowl, and Friday evenings at West Valley Bowl. No formal meetings.

BRIDGE, Tammy Tracy
Weekly bridge games at lunch period in cafeteria.

CAMERA, Dan Cashier
Meet 1st Monday, 7:30 p.m., 18146 Sherman Way, Unit 7, Reseda.

GOLF, Ron Morin
Monthly tournaments on announced dates with meeting at time of tourney.

RADIO, Bob Holly
Meet 1st Wednesday, 11:45 a.m. to 12:30 p.m., Engineering conference room 166. Amateur station is in ham shack at NV antenna range and is available noon hours to licensed amateurs.

RIFLE & PISTOL, Joe Letteriello
Meet 4th Sunday, 7 a.m., Camp Pendleton Range. Compete in Valley league tourneys and fields top marksmen in state and regional matches.

ROCKHOUNDS, George Rigby
Meet 2nd Friday, 8 p.m., 18146 Sherman Way, Unit 7, Reseda, to plan field trips and to use Club lapidary.

ROD & GUN, Dorothy Prychoda
Meet 3rd Tuesday, 8 p.m., DAV Hall, 6543 Corbin Ave., Reseda. Trap shoot at Aqua Sierra, June 12, 10 a.m. Surf fishing trip to Oxnard, June 26.

SPORTS CAR, T. F. Twitchell
Meet 1st Tuesday, 7:30 p.m., DAV Hall, to plan regular competitive events which occur on 3rd weekend of each month.

TENNIS, Bob Reese
Meet Wednesdays, Los Posas Country Club courts, 5:30 p.m.; Balboa Park courts, 6 p.m.

WARM, SUNNY DAYS BRING OUT NVRC ARCHERS TO HILLTOP RANGE

June Arnold is fast learner.

Commissioner Dale Milligan instructs Patty Strick.

Walt Lenoir retrieves arrows, while Dale continues lessons.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 9 | June 16, 1965

Veterans Still Face Moment Of Truth

Despite success after success of Northrop Ventura landing systems, there is still that "moment of truth" in each test or flight when everyone holds their breath.

After astronauts James McDivitt and Edward White splashed down safely last week in their Gemini IV spacecraft, one employee at Ventura Division commented:

"You don't realize you're uneasy about it, but it's great when you know they're back on the ground."

With the addition of McDivitt and White to the list, there are now 10 astronauts who have used Northrop landing systems to return from orbital and suborbital flights.

Commenting on last week's four-day flight, Dr. Robert R. Gilruth, director of the Manned Spacecraft Center at Houston, said:

"I think we are all extremely proud of the performance of this entire team, NASA, military and industry. I couldn't be happier."

Dr. George Mueller, associate administrator for the Center, added: "We are all tremendously pleased with the results. It was one of the most successful missions we have carried out in the

(See GEMINI, page 6)

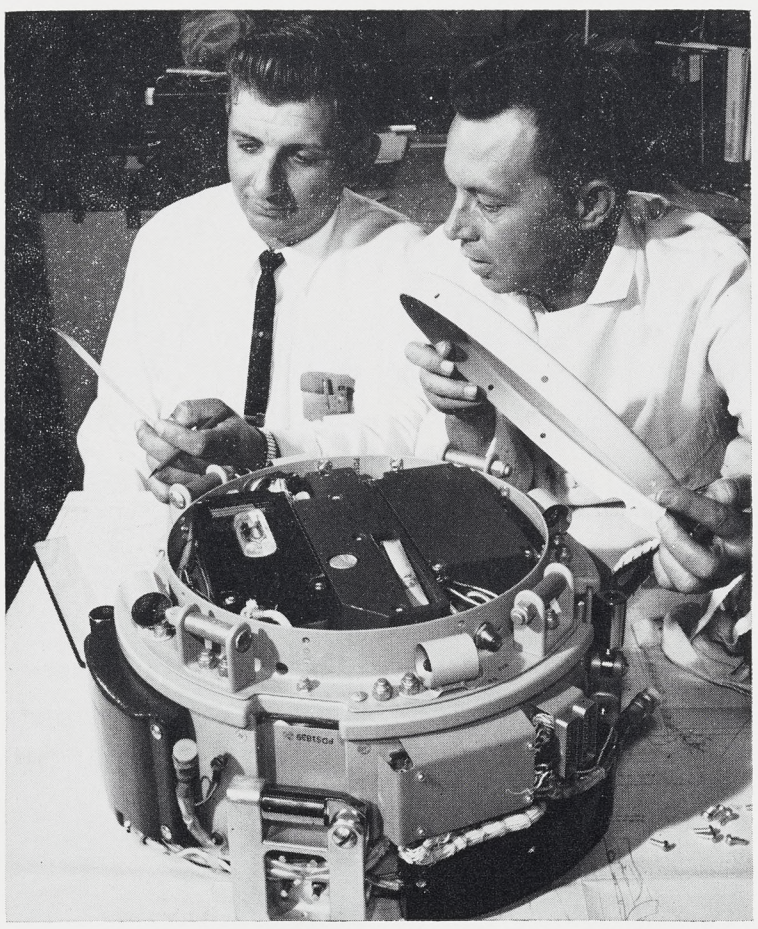
COST REDUCTION LAUDED BY LBJ

A Northrop display on its Cost and Management Improvement Program has completed a nationwide tour during which the Corporation's program was brought to the attention of military and industry representatives in five major cities.

The showings in Los Angeles, Chicago, New York, Washington, and Dallas were in conjunction with the Advanced Planning briefings for industry sponsored by the Department of Defense.

Part of the display was subse-

(See CMIP, page 6)



ROCKET RECOVERY—Northrop Ventura project engineers Larry T. Parson (left) and Mervin (Monty) Cable examine the mechanical and electronic portion of the parachute recovery system developed by Northrop for Sud Aviation's Super-Eridan high altitude sounding rocket system.

Historic Message Beamed To Europe Via Early Bird

Northrop Corporation helped make communications history last week by participating in the first Southern California commercial message test of the COMSAT Early Bird satellite.

Teletype signals bounced off the satellite carried an exchange of greetings between Senior Vice President Richard R. Nolan in Beverly Hills and President and Chairman Thomas V. Jones in Paris.

"We wish to extend our best wishes via Early Bird COMSAT release for the successful participation of the Northrop F-5 fighter and the other Northrop exhibits in the Paris Air show," messaged Mr. Nolan.

"We are happy to be able to send you these greetings via Early Bird from the Northrop exhibit at the opening of the 26th International Aerospace Salon at LeBourget, Paris, France," replied Mr. Jones. "Let us hope that this significant advance in communication will help to promote a still closer relationship between the countries on both sides of the Atlantic."

Northrop was one of a score of California and Arizona firms invited to participate in the test by Western Union International, Inc. Arrangements for the transmission were made by Louise Hobson, Communications supervisor, and Robert W. Rolfe, director, Management services, Northrop Norair.

ONE OF MANY CHANGES

Material Orders Placed in 20 Seconds

While the face of Material Control at Northrop Ventura remains much the same, the pulse of daily operations is gradually acquiring a new pitch with implementation of improved inventory control and warehousing procedures.

Involved in early phases of the long term program are forms, raw materials, stationery supplies, standard parts and perishable tools, according to Bob Pemberton, chief of Material Control.

In one of the first steps, 19 percent of Division forms were obsoleted after a survey by the Forms Control committee. Of the 600 forms maintained at the time of the study, 241 were included in the review. The balance will be reviewed on a scheduled basis.

Stationery costs are expected to be reduced by more than 25 percent over last year, Mr. Pemberton said.

The same type of review is now in progress for standard parts, but a new purchasing procedure has afforded immediate savings.

The installation of a Pacific Telephone Company Dataphone and an IBM 1001 transmitter eliminates up to a week in internal paper handling time required to order and receive hundreds of items.

Applicable only to items which can be ordered on an annual basis, the system involves automatic transmission of data by punched cards over telephone lines to vendors who use an IBM 26 Data Receiver for automatically taking the order.

Del Brumett of inventory control, who is in charge of ordering these items, describes the system this way:

"After we have placed a yearly order, the vendor provides a deck of punched cards which are coded as to item, description and purchase order number.

"To order, I dial a number on the Dataphone (which resembles a small desk calculator with a telephone receiver) and wait for a signal. Then I put the appropriate card in the machine and it automatically records all the necessary data except quantity.

"I then punch out the quantity on the keyboard, hit the register key, and wait for another signal acknowledging receipt. The oper-

(See MATERIAL, page 6)

Recovery System For French Rocket Revealed in Paris

A parachute recovery system similar to the ones developed to return American astronauts from space has been produced for France's space research program by Northrop Ventura, it was announced this week in Paris.

Northrop, which provides the recovery systems for America's manned space programs including Gemini and Apollo, produced the system for the Super-Eridan high altitude rocket probe under contract to Sud Aviation.

This was disclosed at a press conference at the 26th Salon International d'Aeronautique et de l'Espace, where the recovery system was displayed publicly for the first time.

The re-entry nose cone from the Super-Eridan can be recovered on land or at sea. Landing velocity is about 35 feet per second.

The Northrop recovery system consists of five major components: a 1.2 foot diameter Hemisflo pilot parachute; a 3.56 foot Hemisflo drogue parachute; a 41-foot diameter Ringsail main parachute; a flotation bag with 440-pound buoyance, and water location aids including radio beacon, flashing light and dye marker.

Automatic operation of the recovery system is initiated at about 10,000 feet, after the nose cone has re-entered the earth's atmosphere but is traveling at supersonic speed. The aft nose cone cover is blown backward, deploying the pilot parachute which exerts sufficient drag to deploy the drogue parachute.

After seven seconds, the drogue deploys the main 41-foot Ringsail canopy. The parachute is reefed, or restrained to 9 percent of its full diameter for two seconds after which the reefing line is cut automatically, permitting the full opening of the canopy.

Inflation of the flotation bag is begun with a barometric switch actuated at about 3600 feet altitude. In the event of a water landing, a salt water switch releases the main parachute, and turns on the radio beacon and flashing light. Sea marker dye is released from the aft end of the nose cone which floats vertically, nose down.

The system was developed by Northrop and tested in the California desert and in the Mediterranean.

5-11 'TOO SHORT' FOR TIPTOPPER IN U.S. CONTEST

Judy Rohrig, who will compete in the Miss Tall North America pageant next month in Vail, Colorado, doesn't think she has much of a chance to win. At 5 foot, 11½ inches, she's too short.

"Last year's winner was 6-3½," she said.

Judy was named Queen of the San Fernando Valley Tiptoppers last month to earn the right to compete in the national contest. Vying for the title will be representatives of 100 clubs in the United States.

Tiptoppers clubs, which got their start in Los Angeles in 1929, are for girls 5-10 and up and men 6-2 and up. Judy has been a member for eight years.

The Australian-born Queen works in Northrop Ventura Reproduction section.

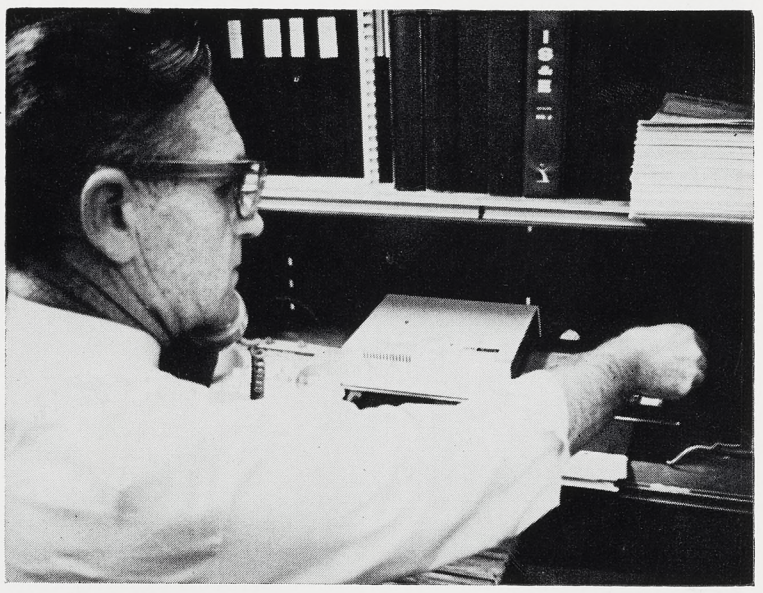
Judy and her mother came to the United States in 1946 after her father's death. Mrs. Calder (only 5-7) was Miss Australia of 1926 and came to the United States at that time to serve as a judge in the Miss America contest.

"I enjoy being tall," Judy says, "but there is a problem in buying clothes. Life has been too good to me. I love every minute of it."

(Photo on page 3)

Fish Trip Set

Members of the Northrop Ventura Boat Club will journey to Anacapa Island June 26 for a fishing trip, Gus Johnson, NRC commissioner, reports.

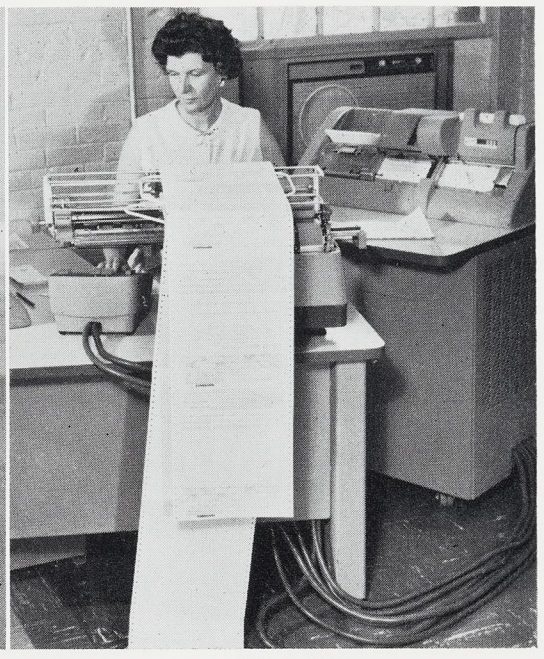


Del Brumett uses Dataphone for instant order of materials.

NORTHROP GALS SECOND TO NONE AS 'SYSTEMS ENGINEERING' COMES TO OFFICES

MARIE STERBENZ
Nortronics, Hawthorne

BETTY WOMACK
Nortronics, Anaheim



ANN KODIS
Nortronics, PPD

Materiel Groups Rely on IBM 632 System To Handle $63.6 Million Yearly Operation

Norair and Nortronics Divisions are employing flexible mechanized systems to keep track of the $63.6 million or more they spend each year with suppliers.

Each month the systems process 6600 purchase orders, 1650 change orders and 17,500 receiving reports.

As replacements for manual systems utilized for years, the new systems are affording division management with increased data control measures, assisting in cost control, and helping do away with many manual steps with resulting reductions in the human error factor.

As the first major industry in the area to adopt mechanized purchase order and receiving report equipment, Northrop traces original application of the system to 1962.

Since that time the system has been placed in use at Norair (Mariposa facility) and Nortronics functions in Hawthorne, Anaheim and Massachusetts (Precision Products Department).

While not interconnected, each system installation generates input for the Northrop Corporation Data Processing function.

Applications of the system in the field of Materiel operations is basically the same, although each division and function reverts to special arrangements to satisfy specific requirements.

For instance, Nortronics (Hawthorne) utilizes the system in performing division accounts payable functions, including the writing of about 3000 checks monthly.

And Norair has found it necessary to make modifications to cover more complex operations.

Ultimately, the systems will give way to other more advanced systems.

Backbone of the system is the IBM 632 electronic typing calculator and its related and supporting equipment.

Nortronics has eight of these units divided among its three operation locations, while Norair utilizes five in a single location.

Norair's Materiel operation is typical of similar operations carried out at the other points.

The 632 units are programmed to accept both punch cards (containing standard notes and clauses) and variable data manually entered via keyboards. Ten-copy purchase order sets are prepared initially along with master and commitment cards which are turned out simultaneously. Master cards are held for subsequent receipt activity and purchase order follow-up reporting. Commitment cards are sorted, used for check tapes, and forwarded to Northrop Data Processing as commitment input.

Subsequent steps involve the duplication of master cards, routing of cards, purchase orders and like data to appropriate functions and other activities. Daily reports issued reflect items received on dock, and items on order as well as delinquent items.

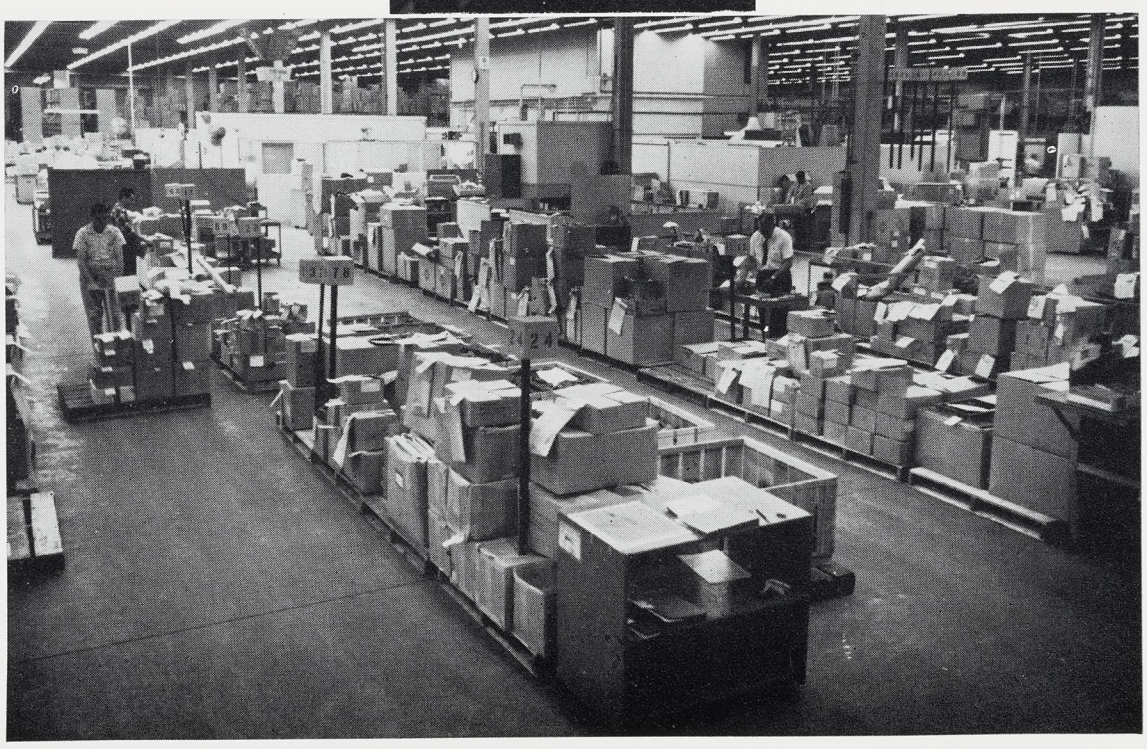
The system at Norair has

(See SYSTEM, page 3)

Five IBM 632 electronic typing calculators (left) are beginning point for Norair's mechanized purchase order and receiving report system. Operators from front to rear are: Ann Gaw, Frances Gibbs, Veronica Gregg, and Marion Condiotte.

END RESULT

Mariposa Warehouse (below) is place where paper meets hardware, as incoming materials are checked and routed to users. Items range from small handful lots to others requiring trailers for movement. A score of employees use mechanized purchase order and receiving report system at Mariposa (above) in two shifts. Cubicles in background are files for purchase order sets. Dorothy Hartman (left) holds handful of permanent tab cards that replace huge stack of forms. Use of punch cards in lieu of forms provides tremendous savings in filing space.



Staffs Meet Challenge of New System

Implementation of the 632 systems of mechanized purchase order and receiving report operations was a challenging experience for the men and women involved at Norair and Nortronics.

Normally, such a system required a year or more of detailed programming prior to adoption. Northrop organizations went through this phase in a matter of a few months. And instead of gradual installation over an extended period of time, the systems went into use in one all-inclusive move.

In short, manual methods employed for over 20 years were discarded and automation installed virtually overnight.

The new systems did not require the hiring of new personnel or detailed training programs. Northrop employees were trained on-the-job in minimum elapsed time.

"Northrop people deserve a great deal of credit for the success of the 632 system," said D. A. McInnis, Nortronics director of Materiel. "Each one accepted a new assignment, learned it quickly and is now performing it efficiently."

Many Northrop men were instrumental in development of the 632 applications to Northrop operations. Credit is shared by many. Among those contributing significantly to the success and implementation were Bob Clay, Bob Cooper, Gene Shafer, Dick Shave and Charles Benson of Nortronics, as well as J. K. States, Jim Van Dorn and Rose Roth of Norair.

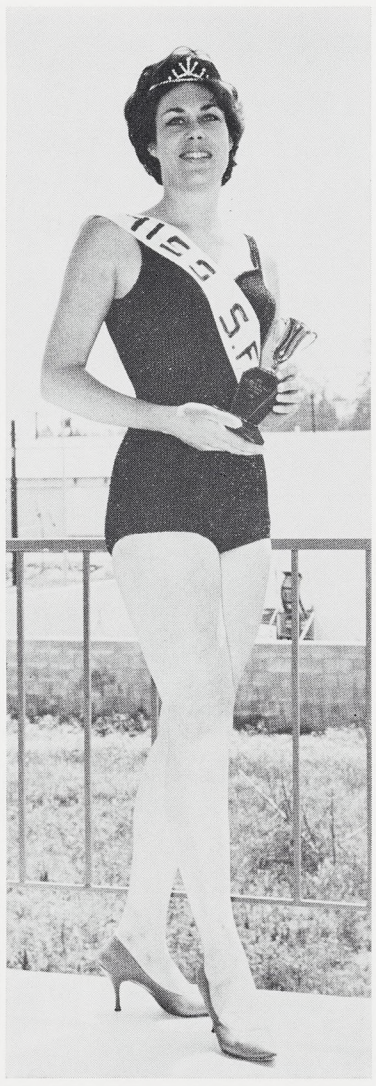
SYSTEM

(Continued from Page 2)

eliminated more than a dozen filing steps, greatly reduced manual posting, and allowed materials and goods to reach the user sooner than was previously possible.

"Information data, such as that supplied us by the 632 system, is mandatory in advanced material management," said Carl Hood, Norair director of Materiel. "While considerations of cost quality and delivery are still of paramount importance, Materiel involvement in all aspects of legal, regulatory, and financial management make day-to-day visibility of procurement activity essential. It can best be achieved through the application of automated data processing."

TIPTOPPER



Judy Rohrig of Northrop Ventura, Queen of the San Fernando Valley Tiptoppers Club, will enter Miss Tall North America pageant next month in Vail, Colorado. She is 5-11½ without heels.

Northrop Experts To Give Papers

Northrop Corporation personnel will be in the forefront July 26-29 during the second annual Meeting and Technical Demonstration of the American Institute of Aeronautics and Astronautics to be held in San Francisco's Civic Auditorium.

Richard E. Horner, Northrop senior vice president, is national president of AIAA and will preside.

Welko Gasich, Northrop Norair vice president and assistant general manager—Technical, will participate in a distinguished panel discussing "Future Trends in Aircraft Design."

Scheduled to present papers are R. N. Worth of Northrop Ventura (Spacecraft Session) and Sidney Thurston of Northrop Norair (Underwater Propulsion Session).

Northrop's Airborne Lightweight Optics Tracking System will be among technical demonstrations presented.

NORTRONICS GIVES ASSIST

Norair Perfects New Techniques For Aircraft Electrical Assembly

Northrop Norair has perfected new techniques for utilization of an old electrical assembly standby — the harness board — to produce components for the supersonic T-38 and F-5.

Credit for a special assist in this effort goes to Northrop Nortronics.

Each T-38 trainer and F-5 fighter contains 38 or more intricate electrical subassemblies fabricated in Norair's Electrical Subassembly operation headed by Tom Duddleston, general foreman. Some of these units contain as many as 60 individual wires of a dozen or more shapes, sizes and coverings.

Previous manufacturing routines called for wiring for each component or assembly to be cut to size and packaged. Packages then went to operators who installed them, often within the confines of small and compact housings. Cutting, stripping and soldering were also performed in equally-cramped quarters.

Now Norair utilizes refined flat-surfaced harness boards with permanent Mylar coverings. Each assembly has its own board and each board is clearly coded, showing the exact routing of individual wires through pins set in the boards. Routing, tying, cutting to size and stripping are accomplished in successive moves. The board is then reversed and all required relays, timers, circuit breakers, etc. are mounted in designated slots and terminations (soldering) accomplished. The completed assembly is then lifted off the board and is ready to be secured in its housing unit.

Enhancing the operation are special slotted wire boxes for each harness board. Wires are placed in coded bins that correspond to harness board codings. Operators merely take from the boxes the appropriate wires by code number. It is now possible to cut as many as 100 wires to desired dimensions for loading many boxes, thus eliminating the practice of sorting and packaging groups of wires for assemblies.

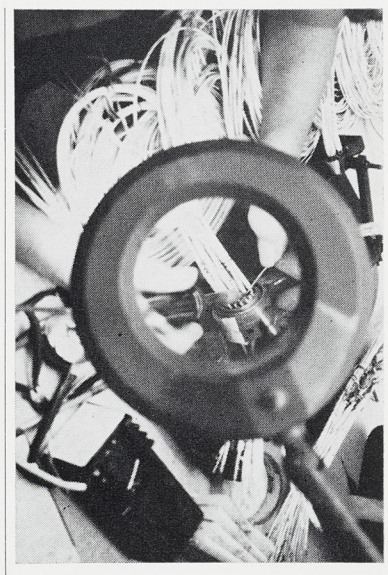
Norair has noted an increase in production through the elimination of manufacturing steps, simplification of decisions to be made by operators, and a reduction in training time for new employees as a result of the new techniques.

SNIP, SNIP AT RAPID CLIP—New Northrop Norair electric harness board allows Alice Runser to move more rapidly in turning out T-38 and F-5 components. Wire box contains wires coded to match harness board. Magnifying glass (below) enlarges intricate soldering operation on T-38 electrical subassembly.

"Our harness boards are actually training units, since the operator has only to follow coded directions," Mr. Duddleston said. "We feel the combination of advantages using this technique will result in cost reductions which will pay for installation of each harness board—wire box installation in about a year."

Working with Mr. Duddleston and his staff in perfecting present techniques have been such men as C. Z. Stine and R. H. Faulks of Education and Training; Matt Friedman and Lee Howell of Northrop Nortronics (where a similar system was developed previously); and W. P. Clott of Loft and Template section of Tooling.

The latter group turns out the new harness boards (about 30 are now in use) and helps in perfecting wire box units.



CRITICAL JOBS OPEN

Cash Offered for Employment Referrals

Northrop Corporation employees everywhere may be in a position to assist Northrop Norair in filling critical professional job openings and at the same time earn a cash award for their interest.

Norair's Employment Referral Award Plan provides payments of $100 or $200 to any Northrop employee who refers applicants who subsequently fill critical openings carried on prevailing critical lists.

For instance, a Nortronics (Anaheim) employee refers a friend or associate who ultimately joins Norair in a critical job classification. The employee earns the award specified for the opening.

In the past this method has been highly successful in attracting subsequent employees who are still on Northrop payrolls, making significant contributions to Northrop operations.

New applicants must remain on active payrolls for 90 days before referral awards are made.

At present prevailing critical openings worth $100 awards for referrals are in Technical organizations (engineers and research analysts) and Northrop Data Processing (programmers).

Critical openings warranting $200 referral payments in Technical organizations include senior engineers, engineering specialists, senior research analyst, scientists, senior scientists, senior technical specialists, and members of Technical management. In Northrop Data Processing the list includes senior programmers and data processing specialists.

Referral cards are available at all Northrop Industrial Relations offices. They should be completed and submitted to precede or accompany this referred person or his application.

VACATION CAN'T END TOO SOON FOR DENMARK-BOUND COED

For Bonnie Punt the summer months ahead may tend to drag a bit in view of what is in store for her in the fall.

Miss Punt, 19, is the daughter of Bunny Burgart, Group Insurance claims analyst assigned to Nortronics (Anaheim) for the past 12 years (she's been with Northrop 14 years).

Miss Punt is one of 50 Whittier College students selected to attend the University of Copenhagen (Denmark) this fall. She will attend class fulltime and reside with a Danish family during her September to February stay there.

Her selection for this honor was based on grades, maturity, citizenship and all-around personality. In addition to her semester of study at Copenhagen, she will tour France, England, Holland, Germany and Berlin at the onset, then take her annual Christmas vacation on another tour to visit Italy, Austria and Switzerland.

While winning this honor is especially attractive to Miss Punt, she's no stranger for honors bestowed. She is attending Whittier College on a scholarship given by the Colonial Coeds for grades, citizenship and general maturity.

And during 1963 she was selected to represent the Anaheim Council of the Girl Scouts at a national meeting of Girl Scout leaders held in Nassau.

Miss Punt, an attractive and modest youngster, has long been active in Anaheim youth activities and has consistently ranked among the top students in her classes scholastically.

She is currently finishing her freshman year at Whittier.

Symphonaires Slate Mikado Production

Northrop Symphonaires will present a one-night production of Gilbert and Sullivan's Mikado at 8 p.m., June 26 at Nyman Hall, Hawthorne High School.

The public is invited and there is no admission charge.

Burt Bracher will sing the leading role of Mikado. Featured will be Lois Cummins, Jim Sena, Vance Landers, Joe Cuny, Bee Boggess and Georgia Anderson.

The director is Paul Brizuela, formerly associated with the Roger Wagner Chorale.

Fortnight in Review

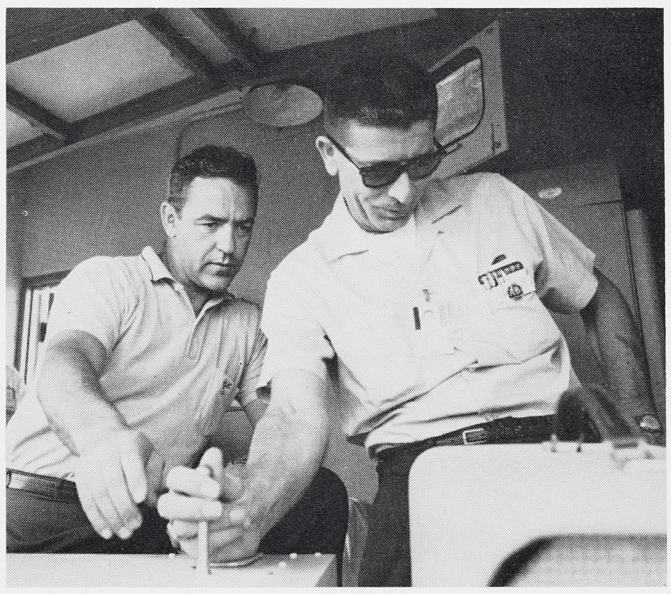
...AT HAWTHORNE...

Colonel William R. Lawley (right) recently named Air Attache to the Philippines, visited Northrop Norair last week. He is looking at F-5 model with Dan Darnell, manager of Customer Relations following briefing and tour of F-5 assembly line. The Philippines will receive F-5's for their defense forces.
Helicopter (below) lifts materials for Norair air conditioning addition from truck to building top, saving time and money. In four hours 30,000 pounds were lifted.

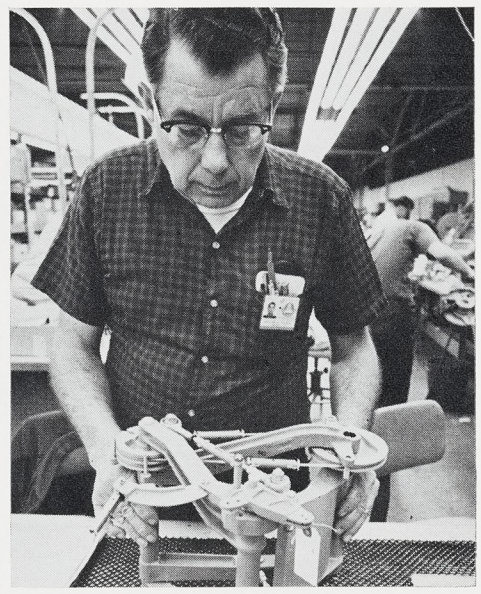
IN THE CONEJO VALLEY...

Students from Oxnard High School toured Northrop Ventura facilities as part of vocational training program established last year by school in cooperation with Ventura Division and three other Conejo Valley firms. Participating companies furnished visual aids, instruction manuals and hardware for use in classrooms.

...AT CAPE KENNEDY AND ANAHEIM...

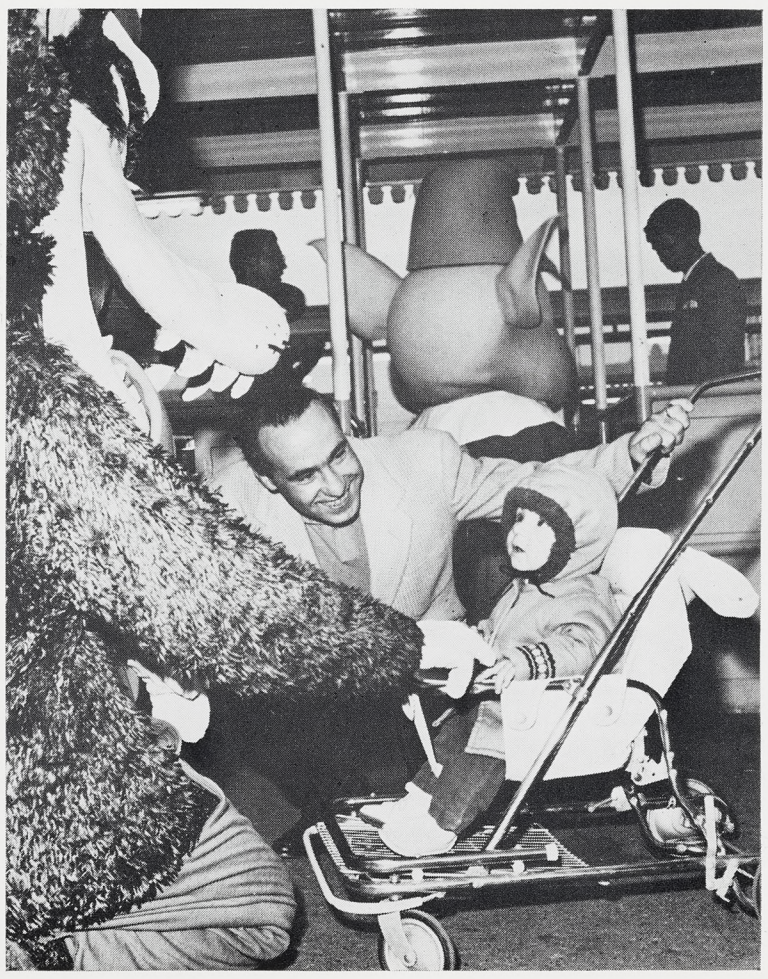


Breadboard model of Airborne Lightweight Optical Tracking System, developed by Northrop Nortronics, received another test at Cape Kennedy (above).

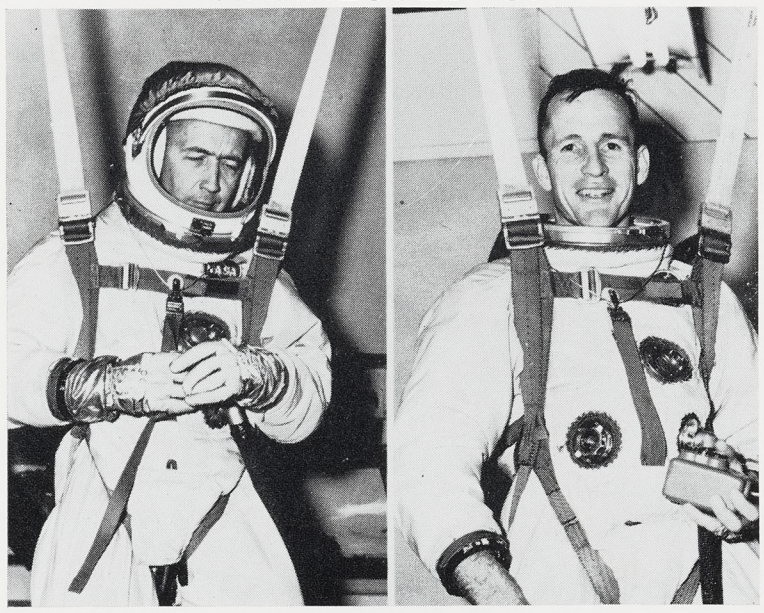


In photo at right Bill Willis and other craftsmen work on one of several projects at Anaheim.

. . . AND DEEP IN THE ENCHANTED KINGDOM,
NORTHROP AND ITS FAMILIES WORKED AND RELAXED



HARNESSED UP



Astronauts James A. McDivitt (left) and Edward H. White—the crew of Gemini IV spacecraft which splashed down safely last week under an 84-foot Ringsail parachute developed by Northrop Ventura—are pictured during fitting by Northrop specialists for personal parachute harnesses prior to flight.

PAGE COVERS PACIFIC

It's Already the Next Day When Hawaii Calls Saigon

Page Communications engineers wake up early.

Two or three mornings each week in Honolulu Guy Warren, manager of Field Services, Pacific, turns off his alarm clock at 4:30 a.m., makes himself a pot of coffee and places a call over the military joint switchboard to Washington headquarters.

Through such communications, Washington is kept informed of the status and progress of the company's various maintenance and operations projects in the Pacific and Far East areas.

Guy picks this unseemly hour to call for two reasons: First, because of the time difference, it is then 9:30 a.m. in Washington. Second, high-priority telephone traffic is relatively light at that time of day.

During the conversation questions may arise concerning Page business in Vietnam, Thailand or the Philippines. Guy then may place a call to John Kendrick, system manager for several M&O projects, in Saigon without fear of routing him from bed. It is then 10:30 p.m. the following day in Saigon.

The vastness of the Pacific is reflected in transportation as well as time.

Until recently when the Military Air Transport System began chartering jet airliners across the Pacific, a flight from Honolulu to Okinawa may have taken 22 hours. Now the same trip requires less than seven hours by jet—still a long flight for those accustomed to travelling within the continental U.S.

A trip in the Pacific Trust Territory to the remote islands of Ponape or Koror, located in the Carolines, where Page maintains facilities for the Army, is dependent on the erratic schedule of the once-a-week amphibious plane which shuttles between the islands and Guam.

An inspection trip from Honolulu to Ponape and return may require two weeks in order that the inspector may spend two days at the station.

An example of Page participation in Pacific communications: a message sent from a communications center near Honolulu is received almost instantaneously in a communications van in Ubon, Northern Thailand.

During transmission, the message passes through three communications systems, four nations, and the Pacific Trust Territories of the United Nations — a total of 14 communications stations. And Page people are on duty around the clock at all of these stations.

Today, most of Page's field service specialists are working in the Far East. This reflects the general shift of emphasis which the government has placed on communications system expansion. Page men formerly assigned to Europe and Africa have been transferred to the Far East to augment existing Page capability in the area.

The result is an organization of skilled technical and administrative personnel ready to meet any challenge to communications of the Free World.

NORTHROP NEWS

Vol. 23 No. 9

A Northrop Corporation Publication
9744 Wilshire Blvd., Beverly Hills, Calif.
Published every other Wednesday

Permission to publish material with credit to Northrop News will be granted.
Telephone: CR 4-8061, BR 2-8581.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 .pm.

Valley Dr. & 24th St., Hermosa Beach. Earl Noble, ext. 2544. 2

7:30 a.m. — 4:15 p.m.

Alma & 24th St., Manhattan Beach. L. Berg, ext. 2763, 672-5578. 3

El Segundo Blvd. & Aviation or 120th St. & Isis Ave., Hawthorne. Penny L. Prouty, ext. 1456, OS 6-1286. 3

8 a.m. — 4:45 p.m.

Wilmington & Victoria, Compton, D. K. Choo, ext. 2500, 631-4675. 5

Proctor Ave. & 5th Ave., in La Puente, Gardena. Norma Gallagher, ext. 2711, DA 7-9518. 5

Rides Offered

7:30 a.m. — 4:15 p.m.

Crescent & Dale, Buena Park, D. H. Eaglin, ext. 2655, TA 8-2857. 13

8 a.m. — 4:45 p.m.

Wilmington & Victoria, Compton, D. K. Choo, ext. 2500, 631-4675. 15

Proctor Ave. & 5th Ave., in La Puente, Gardena. Norma Gallagher, ext. 2711, DA 7-9518. 15

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Rifle, DCM Springfield, military-type, w/govt. ammo., $10. L.A., 754-4384. A

Stove, 1963 GE automatic, elec., $99. Torrance, 325-8211. A

Oldsmobile, 1954, rebuilt eng., needs body work, $165. Inglewood, 672-8830. A

House, 3-bdrm., 1 & 1¾ bath, fireplace, dishwasher, fenced yd., sprinkler sys., h/wood floors, plaster walls, $22,000. Brea, JA 9-3704. A

Sloop, 18′ Silhouette Class, 2 berths, incls. near new Evinrude 3 h.p. aux., $1500. Hawthorne, OS 9-2156. A

Textbook, Business Data processing & computer programming by Gregory & Von Horn, $4. El Segundo, EA 2-0222. A

Shotgun, Winchester, model 50, 20 ga., deluxe variable polychoke & recoil pad, $85. L.A., PL 6-0015. A

Wiglet, machine-made, light brown, human hair, worn once, $25. L.A., HO 5-9459. A

Camera, 8mm movie type, magazine load, Dejur Fadematic, turret model, 2 lens GE exposure meter & type A filter, $40. Box 901. A

Ford, ½-ton, 1950, Olds. eng., $350. Torrance, FR 1-5916. A

Karmann Ghia, 1963, under 12,000 miles, radio, seat belts, $1550. Torrance, 371-8939. A

Honda, 1964, 90 cc, 1-owner, black, $280. Inglewood, 671-5257. A

Sewing Machine, Pfaff, straight-needle, buttonhole attachment, portable, $25. Lawndale, OS 5-7316. A

Home, custom 3-bdrm., family rm., 1¾ bath, corner lot, completely fenced, landscaped, sprinklers, detached oversize gar. w/work rm., indoor BBQ, GI appraisal, $32,500. L.A., FA 1-4621. A

Tape Player, for auto, stereo, w/tapes, $75. Torrance, DA 4-8814. A

Buttonhole Attachment for Kenmore rotary sewing machine, $1.50. Hawthorne, OS 6-0041. A

Washer, Frigidaire, auto., w/Wedgewood gas dryer, $125. Sherman Oaks, 789-4635. A

Bicycle, girl's, 26″ 3-spd., green, $25. L.A., 292-4958. A

Air Conditioner, 1-ton, 11,000 B.T.U., Fedders, 2-yrs.-old, used one summer, operates on 110 volts, clock & auto. timer, $150. Ventura, 805-643-9413. A

Bedroom Set, dbl. bed, hard rock maple, night stand, desk-chest, mirror-dresser, chest-on-chest, $100. Manhattan Bch., FR 4-8036. A

Washing Machine, Kenmore auto., used 8 mos., $100. Playa del Rey, 378-0955. A

Range, gas, Norge, 36-in. wide, clock/timer, bottom broiler, $95. San Marino, 281-3588. A

Cemetery Lot, Inglewood Park, 2, dble. interment, El Portal sect., $1815. Palos Verdes Pen., 377-1180. A

Bedroom Set, twin beds & headboards, 2 3-drawer chests, bookcase, $45. Torrance, 378-0094. A

Honda Scrambler, 1963, custom paint & access., chrome, $600. Portuguese Bend, FR 7-2921. A

Ford station wagon, 1956, V-8 auto. trans. needs repair, good tires, $75. Gardena, DA 9-4954. A

Ercoupe, model 415-C, 85 h.p., all metal, very low time, $2850. Redondo, FR 4-2915. A

Chevrolet Impala, 1958, 2-dr. h/top, p/s, 3-spd. 348 eng., $550. Gardena, DA 4-0158. A

Dodge, Coronet Lancer, 1956, 2-dr., p/s, p/b, recent o/haul, $295. Gardena, DA 9-2904. A

Bed, Hollywood w/box spring & 6 dresser drwrs., $38. Hollydale, ME 3-2395. A

Baby Scale, precision-type, $8. Hermosa Bch., 376-5131. A

Apt. Bldg., 4-unit, near Northrop, 8-mos.-old, $67,500. Hawthorne, 676-6134. A

Couch & Matching Chair, overstuffed, sage color, $15. Inglewood, 672-5578. A

Swimming Pool, 12′ dia. x 3′ Doughboy, complete w/filter, vacuum, ladder, $50. Box 902. A

Stove, Gaffers & Sattler, deluxe model, avail. June 19, $150. L.A., 291-7715. A

Exercycle, 1-yr.-old, $400. Inglewood, 674-4192. A

Screw Jacks, 4, 1¼″x6″ hvy-duty, for house or mobile home, $15. Huntington Pk., 589-9503. A

Sailboat, 24′ Hershoff, rare h/woods, teak decks, inboard, full boat cover, $6500. San Pedro, TE 3-6037. A

Apt. House, 4-unit, Fullerton Col. dist., tenants pay util., 2-bath, air cond., patios, $629.50 mo. inc. for $7500 down, $61,500. Buena Park, TA 8-2857. A

Power Edger, May Co.'s best, $55. Inglewood, 675-0521. A

Surfboard, Jacobs, 9′, $50. Manhattan Bch., 372-6603. A

For Sale

Wheels, 3 chrome, 2 Tempest & 1 Chevrolet, 15″ & standard reverse, $25. Lynwood, NE 1-9322. A

Surface Unit, Universal-Waste King, gas, never used, $45. Canoga Park, DI 0-7752. A

Pram, 8′ & 1½ h.p. Evinrude, glassed seams, oars, $80. Redondo Bch., FR 4-2188. A

Ford, 1930 Model A, stock, 4-dr. sedan, $175. Santa Monica, EX 4-3345. A

Carpet, 40 yds., plain, all wool freize, plus 4 bound scatter rugs to match, rose-tan color, $150. Gardena, 327-4791. A

Telescope, Tasco, 266X, tripod, carrying case, lenses, $50. Gardena, DA 9-9219. A

Dinette Set, formica, chrome finish, 12″ leaf, oval shape, 4 chairs, $50. Manhattan Bch., FR 2-6916. A

Tape Recorder, 4-track stereo, w/2 microphones, takes RCA or convent. cartridge, Silvertone, $170. Buena Park, LA 1-4711. A

Wristwatch, Omega Seamaster, gold auto. luminous & waterproof w/gold expansion band, $90. L.A., 464-6730. A

Buick, 1962 Special, V-6, 2-dr. coupe, $1100. Hawthorne, 677-4271. A

Pups, Boxer, AKC reg., $50. L.A. 670-5627. A

Ford, 1959 Galaxie 4-dr. sedan, p/s, r/h, recent new paint & radiator, $575. Redondo Bch., FR 5-3914. A

Shotgun, 12-ga. J. C. Higgins, w/polychoke & vented ribs, 7-mos.-old, $75. Inglewood, 674-1651. A

Trailer, 1-wheel, wood box, incl. hitch, $30. Huntington Bch., 714-897-7166. A

Accordion, 120 bass w/case, $100. Venice, EX 1-2040. A

Home, contemporary, 1500 sq. ft., 3-bdrm., 2-bath, fireplace, family rm., landscaped, outside lights, fence, brick patio, sprinklers, 1½-yrs.-old, $29,500. Thousand Oaks, 805-495-9573. A

Trailer, 1962 Shasta, 12′, lightweight, butane, 120-V, sleeps 4, $750. Redondo Bch., 376-2117. A

Jeep station wagon, 1°53, new crankshaft, recent o/haul, new tires, $250. Inglewood, 677-6562. A

Enlarging Lens, Schneider Componar f4.5-75mm, $20. Inglewood, 671-9269. A

Air Cooler, Presto 900, 3-spd., cart, used twice, $25. Costa Mesa, 545-3611. A

Oldsmobile Dynamic 88, 1960, 2-dr., h/top, p/s, p/b, r/h, auto. trans., orig. owner, $700. Sherman Oaks, 784-9776. A

Nash, 1951, $150. Hawthorne, OS 9-6215. A

Books, Great Books of the Western World w/syntopican & bookcase, linen bound, $225. Fullerton, LA 5-2767. A

Chevrolet Impala, 1960, 421 cu. in., many extras, $1750. Inglewood, 674-1847. A

Movie Projector, 18mm Tower, 750 watt, forward, still, reverse & rapid rewind, $50. Hawthorne, 675-8413. A

Fairlane, 1957 convertible, auto., new top & tires, r/h, p/s, p/b, $400. Palos Verdes Pen., 377-5084. A

Boat, 16′, 12 gal. built-in gas tank, 1962 Mercury Marc 700, 70 h.p., less than 50 hrs. on eng., Hewitt trailer, many extras, $1395. Redondo Bch., 376-1491. A

House Trailer, 10′, sink, ice box, bed, $135. L.A., LO 9-8524. A

VW Microbus, 1962, deluxe seats, good eng., tires, radio, cot to fit, $1300. San Pedro, 833-5935. A

Micrometer, Lufkin, 1-2, $6. Gardena, DA 4-8853. A

Rambler, 1959 station wagon, 6-cyl., r/h, 68,000 miles, 1-owner, $175. Pac. Palisades, GR 2-2848. A

Flash Equipment, Ultrablitz MK-II elect. flash, Nicad battery w/charger & A.C. cord, 40 watt-secs. power, $25. Los Alamitos, GE 1-4233. A

House, 2-bdrm., R-3 lot, $4000 dn., $27,900. L.A., AX 2-9489. A

Buick sta. wagon, 1956, r/h, good tires, $350. Rolling Hills, FR 8-5856. A

Cabin, Big Bear, 2-bdrm., knotty pine interior, full bath & fireplace, $2000 dn., $11,-500. Redondo Bch., FR 8-2055. A

Radio, coin-operated, night stand size, convert. to play w/out meters, $4. Burbank, PO 1-9565. A

Tape Recorder, 1963 Akai M-7 model, 4-track stereo, 2 lge. speakers, all access. plus extras, over 30 erasable tapes, $350. Manhattan Bch., 372-0816. A

Beds, twin, maple, can be made into bunk beds, $12. Torrance, 375-1756. A

Window & Screen Set, alum., crank-out-type, 3′x4′, $20. Torrance, FA 8-3306. A

Go-Cart chassis, accelerator & brake linkage, padded seat & back, steering & eng. mount installed, needs eng. & wheels, $30. L.A., 476-1635. A

Cat, Siamese, 1½-yr.-old, female, bluepoint, papers, shots, $25. Culver City, 838-4378. A

Bicycle, boy's, 24″, $20. Rolling Hills Est., FR 5-8536. A

Travel Trailer, 15′, 1957, new tires, elec. brakes, water tank w/pump faucet, $650. Gardena, DA 3-7988. A

Falcon, 1961 4-dr. wagon, r/h, s/belts, auto., 1-owner, $800. Torrance, 328-3509. A

Wanted to Buy

Stamps, S&H Green &/or Blue Chip, $3 bk. Inglewood, 674-1847. B

Studio Couch. Hawthorne, OS 9-6982. B

Patio Furniture, used, reasonable. Anaheim, PR 6-2578. B

Tent w/floor, 9x12 camping-type. Gardena, 324-3760. B

Wanted to Buy

Swing-Lawn Set, including sliding board, must be sturdy & reasonable. Gardena, DA 3-6745. B

Chevrolet, 3-spd. trans. w/overdrive, for 1960 283 eng. Whittier, OX 3-4117. B

For Trade

Corvair 95 Greenbrier, 1964, 4-spd., equipped as camper, trade for late model compact car or sta. wagon. Hawthorne, 675-9557. C

FREE (To Be Given Away)

Dog, good w/children. Gardena, DA 4-4625. D

Kittens, 7-wks.-old. Palos Verdes Est., FR 5-4733. D

Rentals Offered

Sleeping Rooms, pvt. bath & entrance, furn., utilities pd., close to shopping & Northrop, $45 mo. Hawthorne, OS 6-7328. E

Beach House, furn. 2-bdrm. over dble. gar., 4 blks. from ocean, $135 mo. Gardena, DA 4-7688. E

House, 2-bdrm., tile kitchen & bath, h/wood floors, trash & water pd., gar., redecorated, $115 mo. Hawthorne, OS 5-9695. E

Apt., furn., 1-bdrm., ½ duplex, 1 mile from Northrop, lots of closets, gar., adults, no pets, $85 mo. Inglewood, OR 7-4388. E

Apt., 1-bdrm., furn., utilities inc., no children, no pets, $115 mo. Hawthorne, 676-3951. E

Apt., 1-bdrm., closed gar., laundry fac., $85 mo. Torrance, 320-1005. E

Home, 3-bdrm., 1 bath, fenced yd., $115 mo. Fullerton, 528-6914. E

Apt., 2-bdrm., unfurn., lge. pool, all extras, closed gar., near El Camino Col., $115. Torrance, DA 9-5986. E

Unit, owner's, 1800 sq. ft., 3-bdrm., 3-bath, family rm., fireplace, pvt. deck & 3-car sub. gar. w/storage, soft water sys., adults, $260 lease. Inglewood, 373-1143. E

Cabin, Green Valley Lake, $35 weekend; $65 week. Torrance, 320-2002. E

Apt., 2-bdrm., $115 mo. Box 903. E

Apt., unfurn., 1-bdrm., triplex, small pvt. patio, laundry rm., carport, adults, $78.50. Gardena, DA 9-9195. E

Bachelor Apt., 1-bdrm. unfurn. & furn., closed gar., $95 & $100. Palos Verdes Ests., FR 5-0867. E

House, 3-bdrm., 2 baths, 20x20 den, lge. playhouse in rear, walled yd., 10 minutes to Northrop, $160 mo. Redondo Bch., FR6-6415. E

Apt., 2-bdrm., unfurn., near S. Bay Center, $100 mo. Redondo Bch., 376-4978. E

Sleeping Rooms, new, linen furn., $15 wk. singles; $12.50 ea. wk. dble., laundry avail. Lawndale, 371-6775. E

Found

Graduation Ring, in restroom at Disneyland, Northrop night. Van Nuys, 780-5727. K

Personals

Ironing in my home, 1 block from Norair, $1 hr. Hawthorne, 675-6291. L

Will Do Typing in my home, term papers, theses, etc. Inglewood, 676-1475. L

Openings available in A&E Flying Club, 2 Bonanzas, 2 172's. Playa del Rey, 397-6326. L

Please accept my sincere thanks for the many luncheon parties & lovely gifts given me upon my retirement. KAY JOHNSON. L

To NRC & my many friends at Northrop, thank you for all your cards, remembrances & flowers sent to me while recovering from auto accident. RUTH T. LINDSTROM. L

We would like to express our appreciation for the kindness & thoughtfulness during the illness & loss of our beloved husband & father, Herchel Scarberry. Especially Dept. 5503. HILDA & RONALD SCARBERRY. L

Apt, to share w/girl, 20-25, 1-bdrm., furn., pool, 2 blocks to ocean. Hawthorne, 372-7804. L

For Sale or Trade

Ford Country Sedan, 9-pass., 1960, low mileage, 1 owner, $795 or trade for smaller car. Inglewood, 755-1071. M

Apt. House, 5-unit, 1-yr.-old, 2 blks. from Norair, $81,500 or trade for other property. Hawthorne, OS 6-7417. M

Summer Swim Plans Announced By NRC

Northrop's annual summer swim program for employees and their families has been set up again by joint effort of NRC Councils at all locations.

Beginning Tuesday, June 22, and continuing each Tuesday and Thursday through August 19, the program will center at the Leuzinger high school pool, located on Rosecrans between Prairie and Hawthorne.

Northrop families will be admitted without charge from 4:30 to 6:45 on these days. Showers will be provided, but individuals must bring their own towels. Dick Cahill, lifeguard, will be on duty at all times.

Attendance Reporting Is Automated

Northrop Ventura employees can now get immediate answers from their area supervisors on availability of sick leave and vacation time as the result of an automated attendance reporting system now in full operation.

Early reports indicate that the new system has brought increased operating efficiencies to such departments as Payroll, Timekeeping and Industrial Relations, according to Industrial Relations Director Rex Fairless.

Data Processing now provides weekly attendance reports on sick pay and vacation balances and monthly reports on each employee's attendance history such as jury duty, cumulative occupational and nonoccupational illness, based on information transmitted by supervisors on tabulating cards.

Prior to the new system, Industrial Relations was the only source of information on eligibility for sick pay and vacation pay. Now each supervisor has the necessary attendance data on his organization monthly. Timekeeping and Payroll have the necessary data weekly.

In case of absence, employees now notify their supervisors rather than Industrial Relations.

Another major benefit to employees under the new system is the automatic maximum extension of all earned vacations to 24 months. The previous maximum extension for taking earned vacation was 18 months.

MATERIAL

(Continued from page 1)

ation takes about 20 seconds. Delivery is usually the following day.

Mr. Pemberton reports that eventually nearly 5000 different stock items will be included in the system.

"But these will all be small, repetitive type items," he added. "The basic reason for such a system is to efficiently keep as many as possible of the time consuming, little items out of the way of Purchasing so that our buyers can devote more time to major, more costly equipment."

As for the stationery and standard parts reviews, Mr. Pemberton said they would be repeated every six months.

Within the Material Control office a complete change in the method of recording has been made during the last six months. Utilization of VisiRecord equipment and complete redesign of forms anticipates a $7000 annual savings commencing in fiscal year 1966.

GOOD HOUSEKEEPING

Launching a Good Housekeeping program at Northrop Ventura, Engineering Electronic Fabrication Laboratory received banner to be hung in department for one month. John Miller (left), director of Manufacturing Production Operations, and Stiles Burke (right), director of Experimental Operations, flank Carl F. Emerich, general foreman of the winning organization. Banner will be rotated on monthly basis after judging all areas in Production Operations.

Northrop-Assisted Students Tour Assembly, Plastics

Thirteen students enrolled in an Oxnard High School course in industrial assembly techniques which Northrop Ventura helped to develop visited the Ventura Division last month where they saw manufacture of a diverse line of Northrop products.

The plant tour was part of an industry-education vocational training program for high school seniors. Carl Shoesmith, crafts instructor at Oxnard High School, was assisted by Northrop Ventura, Raytheon, Minnesota Mining and Manufacturing Company, and American Brake Shoe in setting up the course in industrial assembly and fabrication.

Participating companies furnished visual aids, instruction manuals and hardware for use in the classrooms. Northrop's Wes Mace also served as an instructor in plastics for a term last year at Oxnard High.

The 13 students, ranging in age from 17 to 19 years, will soon be applying for industrial employment in plastics (vacuum forming, lay-up and injection molding), electronic assembly and other manufacturing jobs.

They practiced actual assembly techniques in the classroom under the supervision of Mr. Mace and representatives of the other industrial participants.

Charles Brady, consultant in vocational education for Ventura County accompanied the students on their tour, which included the plastics area, drone assembly and Paradynamics laboratory.

Bridge Team Takes Second in Regional

The first time was really charm for members of the Northrop Ventura Bridge Club who took second place in their first outside competition during the National Bridge Week regional event in Los Angeles.

Competing against a field of 84 teams representing commercial and industrial organizations from throughout Southern California, the Venturans took first in their section, then went on to place second over-all.

Team members were Kurt Meissner, Ed Cordell, Tammy and Bob Tracy.

Bridge Club members selected the four competitors from those who take part in regular club play during lunch periods at Ventura.

Several pairs representing NRC also competed earlier in the Commercial/Industrial Pairs Championship held May 24. Two pairs won fifth-place honors in this event, according to Commissioner Tammy Tracy.

GEMINI

(Continued from page 1)

manned space flight program."

While the Northrop Ventura project team was as elated as everyone else, Program Manager Stan Gewant voiced a minor disappointment that the 84-foot Ringsail parachute, which gently delivered the astronauts to their Atlantic landing, was not recovered.

"There is much we could have learned from examining the chute, particularly verification of effects of the space environment on the materials used in the system."

Northrop Ventura conducted numerous laboratory tests, but recovering the Ringsail could have verified laboratory findings.

A special helicopter was dispatched to attempt a recovery of the canopy but was unable to reach it before it sank. The astronauts jettisoned the chute upon impact, as in all previous landings.

It was reported that NASA plans to take special pains to recover the chute from the next Gemini mission, a seven-day flight now scheduled for August.

Vice President and General Manager George Douglas presents 25-year pin to Glenn Livingston at Northrop Ventura ceremony this week.

Nine Venturans Get Long Service Awards

Vice President and General Manager George Douglas this week presented a 25-year service pin to Glenn Livingston, supervisor of Operations Support and Technical Services. Mr. Livingston headed an agenda of eight Northrop Ventura veterans honored for long service in ceremonies this month.

A 20-year pin was awarded Vic Matakas at El Centro, where he is unit supervisor in Field Operations on the Apollo project. Mr. Matakas, whose first job with Northrop was on assembly of Northrop aircraft in 1940, is also unit supervisor for the supersonic drone project at Pt. Mugu.

W. Clymer received a 15-year pin and six other Venturans received 10-year pins.

Mr. Livingston is also a former aircraft specialist, having spent 14 years with Northrop in various supervision positions related to aircraft flight tests and field test operations.

For the past 11 years he has held supervisory positions in field test programs and flight operations. He is presently responsible for all low-speed drone flight operations and conducting engineering flight test programs on both new development and product improvement tests.

Receiving 10-year pins were A. Pearson, J. Thompson, W. Keavaney, G. Judge, R. Freymond, and M. Cline.

Apollo Management Club Speech Topic

"The Apollo Program and its Management" will be discussed by Robert Carroll June 23 when the Northrop Ventura Management Club meets at the Woodland Hills Country Club's Terrace Room.

Mr. Carroll is assistant program manager for Apollo at North American Aviation, Space and Information Division.

CMIP PRAISE

(Continued from page 1)

quently selected by DOD for a Pentagon exhibit of contractor cost reduction achievements.

In a letter to President and Chairman Thomas V. Jones, President Johnson noted Northrop's participation in the Advanced Planning briefings and added:

"Please accept my personal thanks for the achievements you have made, and for those which I am certain you will accomplish in the years ahead. You have justified my optimism that, together, we can achieve our common goal of a dollar's worth of defense for every dollar spent."

President Johnson in 1963 made a personal request to heads of major defense contractors to join in a positive program of cost reduction "to help guarantee our country a maximum of defense at a minimum of cost."

In his most recent letter to Mr. Jones, the President wrote:

"You will be pleased to know that seventy-eight of America's largest defense contractors—your own firm included—have formally pledged themselves to this continuing effort toward greater economy, and that those pledges are being daily redeemed in significant cost reductions. As promised in my initial letter, such achievements will be a significant factor in determining future source selections, and in establishing profit and fee rates for noncompetitive negotiated contracts."

TROPHIES FOR TOP KEGLERS

Northrop Ventura Men's Scratch League concluded its first season this month with presentation of trophies. Ted Szostek (left photo) bowled individual high game series of 677, while Tom Clanin, August Quenton, Homer Knowles, and Chuck Taylor (left to right, below) took team honors. League officers are John Kerr, president; Joe Montrose, vice president; and Dan Cashier, secretary-treasurer. Zack Silvers is Bowling Club commissioner.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 10 | June 30, 1965

Three Youths Tie for M-C Scholarships

An unprecedented three-way tie was announced last week for the B. J. Angell and Vivian Long Memorial Scholarships, offered annually by the Northrop Ventura Management Club.

Winners are Robert William Dedon, Edward S. Babcock jr., and Roy Alexander Murray jr. Checks for $400 will be sent to schools designated by each of the winners and will be applied to their education expenses.

The announcement was made by W. F. Green, president of the Ventura club, who added that the awards were based on an evaluation of an original essay, high school scholastic records, faculty evaluations, and citizenship achievements.

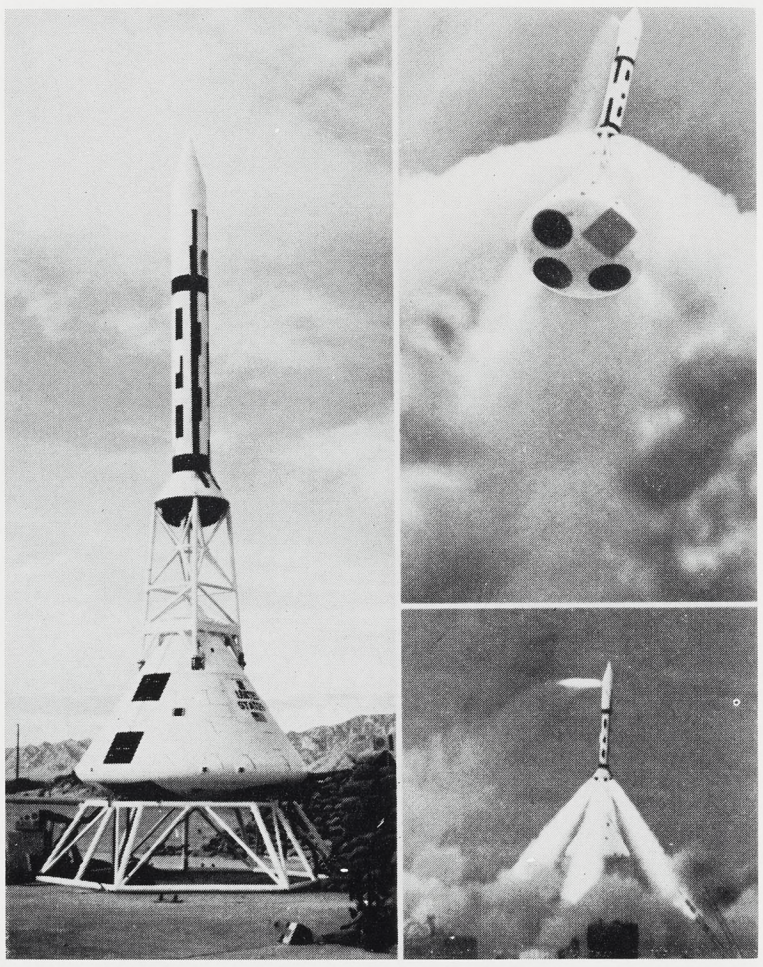
All of the recipients for 1965 are sons of Northrop Ventura employees.

The three-way tie necessitated a change in normal procedures for awarding scholarships, according to Bill Coonfield, chairman of the Scholarship committee.

The two awards — given in memory of former Division employees — normally consist of $750 for first place and $250 for second place. When the tie developed, the committee decided to give three $400 awards.

Committee members in addition to Mr. Coonfield are Dr. A. G. Berger, P. C. Megginson and Charles Merlian.

The B. J. Angell award bears the name of Northrop Ventura's first Management Club president, who devoted many years of his life to youth work. Mrs. Vivian Long was Division librarian until her death two years ago.



ESCAPE TEST—Unmanned Apollo spacecraft demonstrates rocket escape from a simulated Saturn in trouble in this previous, but similar, off-the-pad abort test at White Sands Missile Range near Las Cruces, N.M. At left: spacecraft command module rests on launch pad awaiting signal from block house. Below, right: launch escape and pitch control motors fire to pull the command module and three imaginary astronauts to safety. Top right: tower jettison motor pulls used tower clear of trajectory.

Fourth Apollo System Test Sets Escape on Launch Pad

The Apollo astronaut emergency escape system was scheduled to undergo its second off-the-pad test this week at White Sands Missile Range, New Mexico.

Included among improvements incorporated into the system since the first pad abort test last November 7 is a reefed dual-drogue chute arrangement developed by Northrop Ventura to replace its single drogue used in earlier tests.

While this week's test was to be the second to simulate an emergency escape by astronauts from the launch pad, three other abort tests have been successfully completed—each from a different altitude.

After this week's test, there is only one abort test scheduled. Planned for later this year, the final test calls for the escape system to operate while an Apollo model is tumbling.

The high altitude abort test attempted May 19 was re-scheduled for early next year. A Little Joe booster rocket, carrying a command module, exploded as the result of a failure in its guidance system.

However, the test was termed a "spectacular success" when the emergency escape system functioned perfectly. It was determined that any astronauts on board the command module would have escaped injury.

All tests have come to their successful conclusion under Northrop Ventura landing systems, designed for earth landing of Apollo astronauts.

Northrop Ventura developed the system for North American Aviation's Space and Information Systems Division (Downey), prime spacecraft contractor to NASA.

Launch escape and pitch control motors are supplied by Lockheed Propulsion Company and the tower jettison motor by Thiokol Chemical Corporation.

Air Force Issues Contract For Navigation Computers

An Air Force contract to develop two lightweight, integrated circuit computers to be used in the development of a low-cost inertial navigation system has been awarded to Northrop Nortronics Computer group, headquartered at Hawthorne.

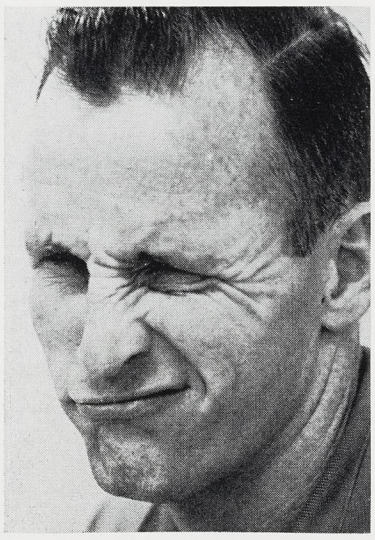
Delivery of the first of the NDC-1050A data processors will be made this November, with the second unit to follow two months later. Also included in the $360,000 Air Force award are control units, displays and gyro torquing devices.

According to a recent authoritative report, Air Force officers assigned to the project indicated the system would be available to commercial as well as military aircraft.

The 20-pound digital computers will be integrated into prototype low-cost inertial systems currently being developed by the Air Force Research and Technology Division's Avionics Laboratory. The work is being done at Holloman AFB, New Mexico.

The NDC-1050A is another in a series of lightweight digital computers developed by the Computer group at Hawthorne.

A-OK



Astronaut Ed White sums up his historic walk in space with a wink as he relaxes after recovery of Gemini IV this month (more photos on page 2).

New Drone Nears Testing Phase, Fills U.S. Target Gap

A low cost turbojet powered target, designed to fill the gap between supersonic and low speed drones presently in service is under development by Ventura Division, it was announced this month by Vice President and General Manager George F. Douglas.

Designated NV-105, the new target is described by Program Manager Don Conlan as a "low cost, variable speed, medium performance target for surface-to-air gunnery and missile system training."

Potential customers, including the U.S. Army, Navy and Marines and Allied forces, have indicated a need for this type of target.

"The NV-105," he said, "is designed to fit into the performance envelope between the 200-knot KD2R-5 and the supersonic RP-76, now in standard Northrop Ventura production."

NV-105 will provide realistic training for crews operating 20 and 40 mm guns, three and five inch deck guns, and more than a half dozen different missiles, he added.

A turbojet engine weighing 30 pounds and delivering 100 pounds of thrust has been modified by Williams Research of Walled Lake, Michigan especially for the new target.

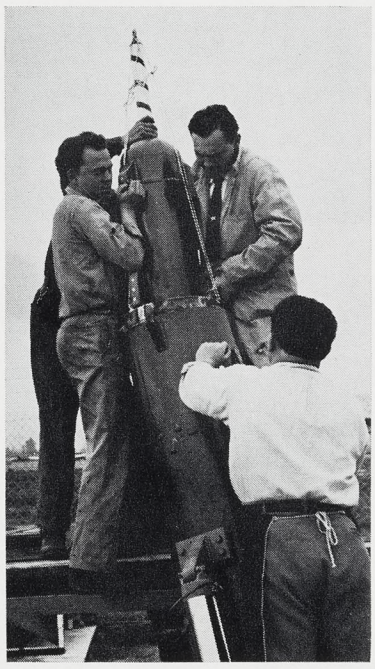
While NV-105 incorporates new configurations in its design, most of the on-board components are off-the-shelf items currently used on the KD2R-5 (Navy) and an advanced experimental model of the RP-76 (Army).

An engineering team has been at work on the development since March of this year under the direction of Jack Conner.

The noteworthy speed in getting demonstration vehicles into fabrication is due primarily to use

(See NEW DRONE, page 6)

OLD TIMES



A Northrop Ventura pioneer in Paradynamics recalls the early days of recovery system testing (when dummies and parachutes were shot from a cannon as shown above) and looks ahead to next generation of hardware (see Ed Ewing's story, page 4).

CLASSES TO TEACH SAFE HANDLING OF SPACE AGE TOOLS

A training program for people who work with hazardous materials is getting under way at Northrop Ventura.

Attending the sessions will be employees who handle such equipment as pyrotechnic and jet thrust devices and such materials as toxic chemicals, flammable liquids and gases and plastic compounds.

A Hazardous Materials and Devices committee, headed by Al Binsacca, has laid most of the groundwork for the training program. Working as a subcommittee to the General Safety committee, the group is represented by Technical, Quality Control, Production Operations, Plant Engineering, Industrial Relations, and Security.

"The record of Northrop Ventura is clean as far as mishaps with hazardous materials is concerned," Mr. Binsacca said, "but safety techniques advance just the same as technologies. At the same time we wish to have a representative number of employees informed as to potential hazards in materials and equipment throughout the plant."

To be organized along the lines of the Northrop Ventura Fire Brigade (which completed its training in April), the class of graduates will give the Division at least one person in every major area of the plant who has the knowledge to deal with crises or accidents that might occur.

In addition to setting up the training program, the committee

(See HAZARDS, page 6)

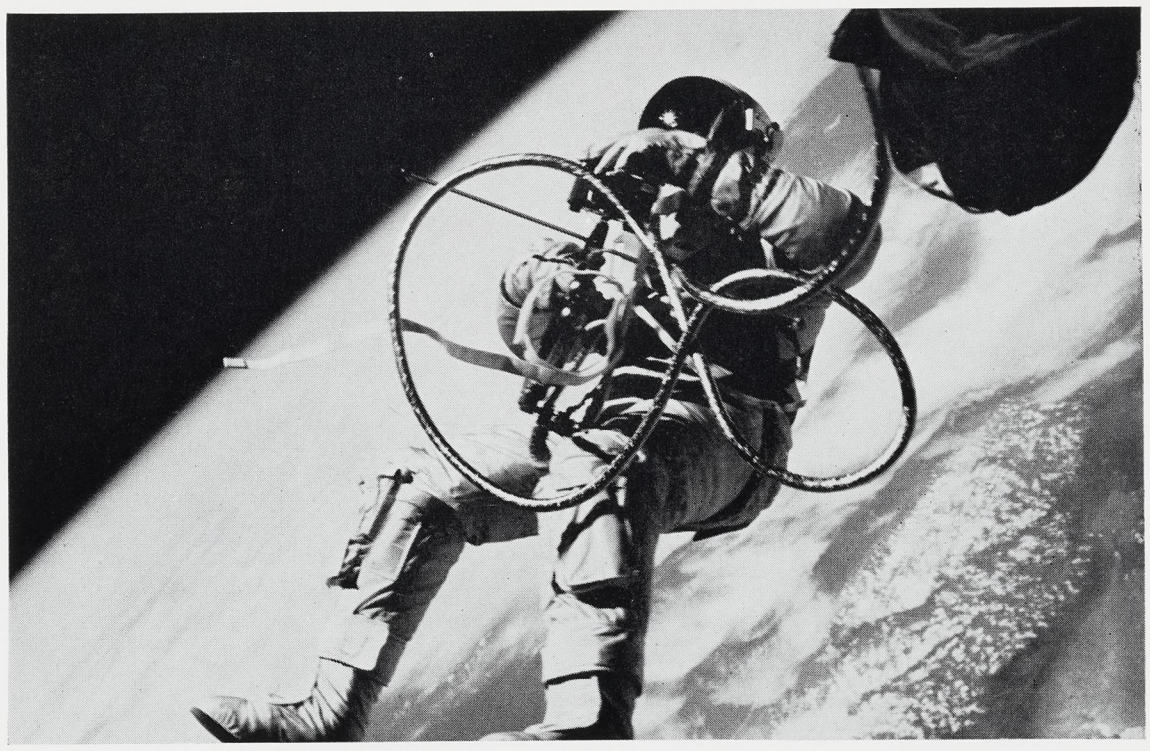
Research Vehicle Delivered to NASA

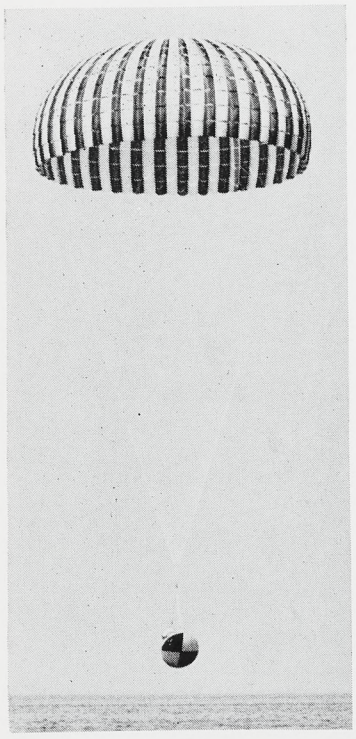
A research craft designed to carry a man in wingless flight was delivered to the National Aeronautics and Space Administration by Northrop in ceremonies at Hawthorne June 15.

Its official title is M2-F2 Manned Lifting Body Research Vehicle. Its mission: to help man solve the aerodynamic problems of controlling future spacecraft within the earth's atmosphere.

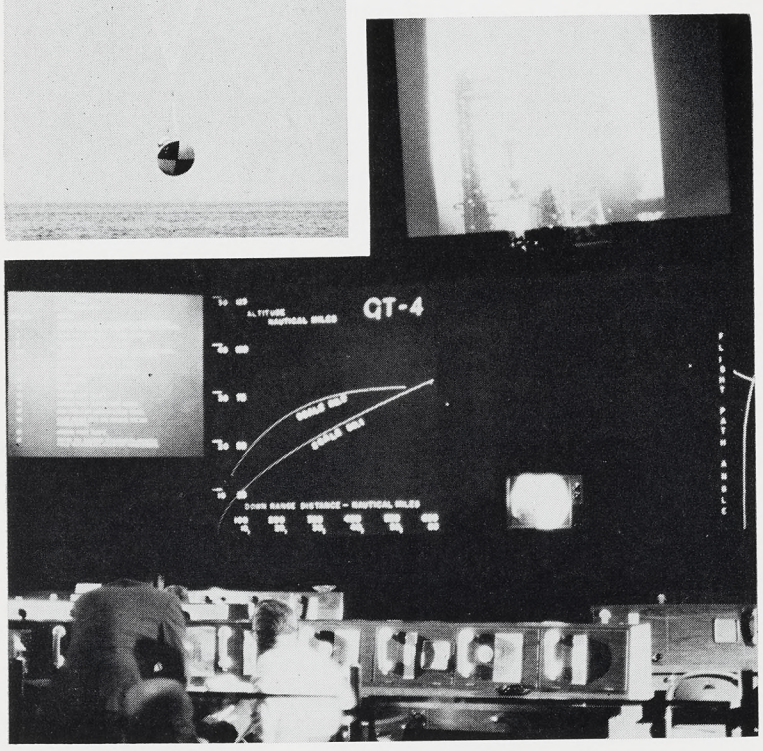
In each of its test flights the delta-shaped M2-F2 will be dropped from beneath the wing of a B-52 bomber, and NASA and Air Force pilots will glide it at high speeds to determine how this configuration would behave in the critical period between re-entry

(See LIFTING BODY, page 6)





Major item in Northrop catalog of activities in and around confines of Cape Kennedy is parachute landing system. Hundreds of men and women work many hours at Newbury Park prior to launch to cut, sew and inspect (top of page) in preparation for dramatic moment when main chute opens (left). During flights and missile launches, Nortronics' Vigicon display system (below) provides necessary data in real time to ground control centers. Northrop specialists were already at work on Gemini V flight, scheduled for August, when Astronaut Ed White was taking his historic walk in space (right).



Northrop at the Cape: A Catalog of Technology

Northrop participation in such Cape Kennedy activities as Gemini, Ranger, Mariner and missile development reflects a depth in multiple technologies so varied, that even Northrop veterans assigned to the space port for more than a decade are still awed by the list.

"An aerial photo of the Cape area marked with sites of Northrop's activities, past and present, would be virtually covered with notations," says Northrop's Herman McDonald.

"Pick your direction from any point—up into the sky, across the land or deep into the depth of the Atlantic—and you'll cross the site of a Northrop activity," Mr. McDonald said.

For instance, there are 600 mm Ballistic cameras as well as ALOTS (Airborne Lightweight Optical Tracking System), both made by Nortronics, for keeping unwinking eyes on launches.

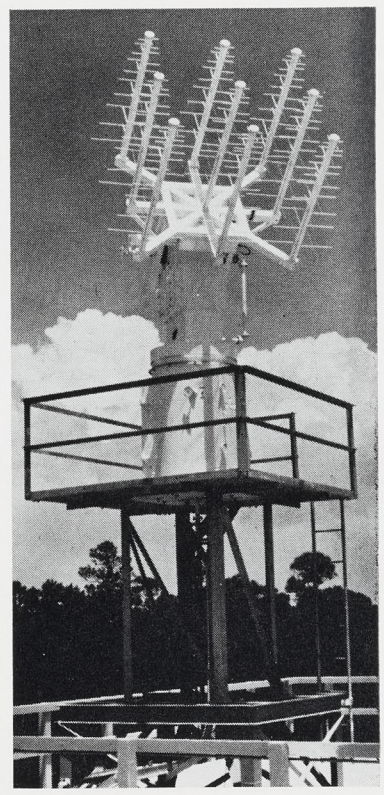
Elsewhere, in the birds themselves, are gyros for Polaris, Saturn, Titan, Atlas and Minuteman as well as a Q-Ball angle of attack systems for Saturn. There are star trackers, sensors and components for Ranger and Mariner, also made by Nortronics.

The automatic checkout and periscope systems for Polaris submarines and gyroscopes galore are other Nortronics products.

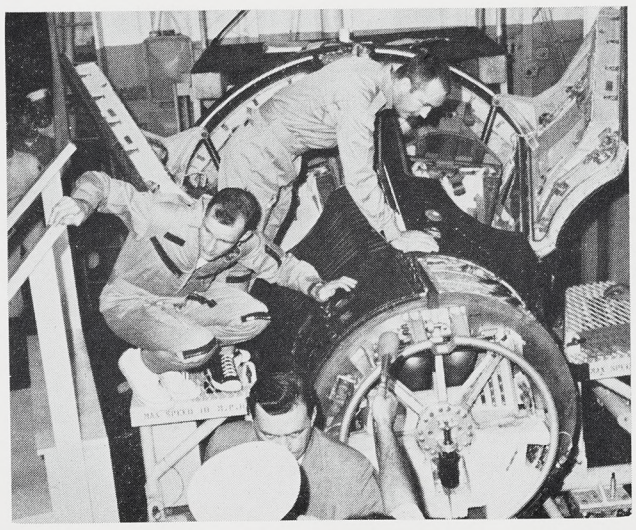
On land, in the new range control center is a Nortronics-developed Vigicon display system for real time screening of launch and range data. On the high seas are range ships equipped with the Mark IV SINS system and there are intercommunications systems for Saturn launch complexes.

Ventura's all-important recovery systems played key roles in Mercury and Gemini flights and will be used on Gemini and Apollo

(See CAPE KENNEDY, page 3)



Page Communications Engineers plays daily role in manned space program with advanced communications stations in the Bahamas.



GEMINI TWINS BOARD WASP CARRIER . . . INSPECT THEIR SPACECRAFT . . . AND CHECK IN WITH PRESIDENT JOHNSON.

Cable to Cape Put in Shape By OMEGA

There was a high wind in San Salvador last month.

Daring it were a U.S. Navy ship, a U.S. Army ship and the U.S. Underseas Cable Corporation (USUCC) cable and repair ship OMEGA.

Their mission was to find and repair a break in a cable 880 fathoms below the surface of the Atlantic Ocean. They had four days to complete repairs to the communications link used for Cape Kennedy contact with the Gemini IV spacecraft (launched June 3).

The 1500 mile cable connects tracking stations in the Bahamas to the Cape.

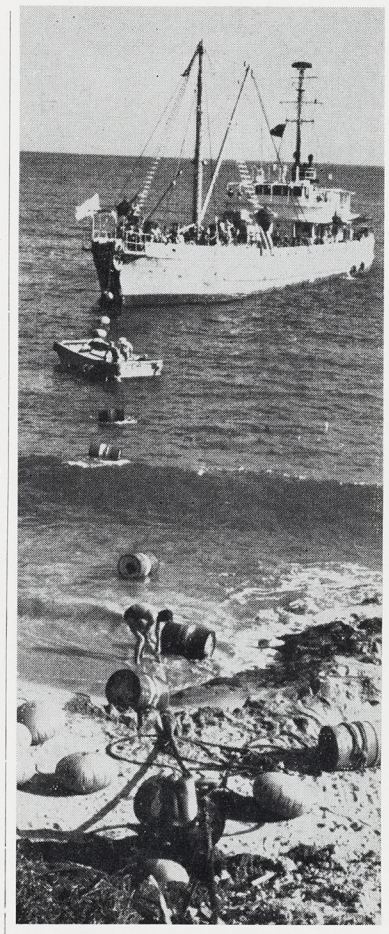
USUCC, a joint venture of Northrop, Phelps Dodge Corporation, and Felten and Guilleaume Carlswerk AG (Germany), dispatched the OMEGA from a Navy assignment in Great Exuma Sound near San Salvador.

Although the break was reached promptly enough — one mile southwest of San Salvador—high winds and rough seas hampered grappling operations.

Air Force Eastern Test Range officials set up an alternate communications chain from Grand Turk Island, Antigua and San Salvador to Puerto Rico to the mainland, using other existing cables and microwaves.

With Gemini IV already in orbit, the Navy ship THOR arrived to retrieve one end of the broken cable and to pass it to OMEGA for splicing with the other end, already on board OMEGA.

Restoration of the direct line from Antigua to Cape Kennedy was accomplished June 4 and resumed its real time transmission. Gemini IV floated to earth June 7 under a Northrop Ventura parachute landing system with only one minute of contact lost in four days.



U.S. Cable Corporation ship OMEGA at anchor off San Salvador.

While USUCC did not lay the Grand Turk-to-mainland cable it repaired, the Washington, D. C. based firm put down a 716 mile continuation of the original system in 1963 for the U.S. Air Force between Grand Turk and Antigua.

Other major USUCC contracts since its formation in 1959 include a cable linking the Philippines with South Vietnam and another linking Oahu in the Hawaiian Islands with Johnston Island in the Pacific.

In addition to its numerous technological breakthroughs in specific areas of oceanographic-hydrospace-communications disciplines, USUCC is the original American company possessing all the expertise and capabilities to carry a cable project from its conception to completion.

Duplicate of Mariner is Crystal Ball For JPL/Northrop Systems Team

A group of specialists, combining the talents of Northrop and Jet Propulsion Laboratory are keeping as close to the Mariner Mars spacecraft as if it were in the same room at JPL in Pasadena.

Their principal tool is a duplicate tool of the real Mariner, now 14 days from encounter with earth's second closest planetary neighbor.

Called a Proof Test Model (PTM), the laboratory craft is used to simulate what is happening to Mariner as it speeds through space on an intercept trajectory 134 million miles from earth.

Six of these specialists (three Northrop and three JPL) are part of the MC-1 (PTM) test direction team, which has been supporting the Mariner IV spacecraft to Mars from assembly through the upcoming conclusion of its 325 million mile journey.

Working in an arena of operational support equipment, the team receives data from the Mariner PTM similar to that which the Space Flight Operations facility (SFOF) receives from Mariner IV.

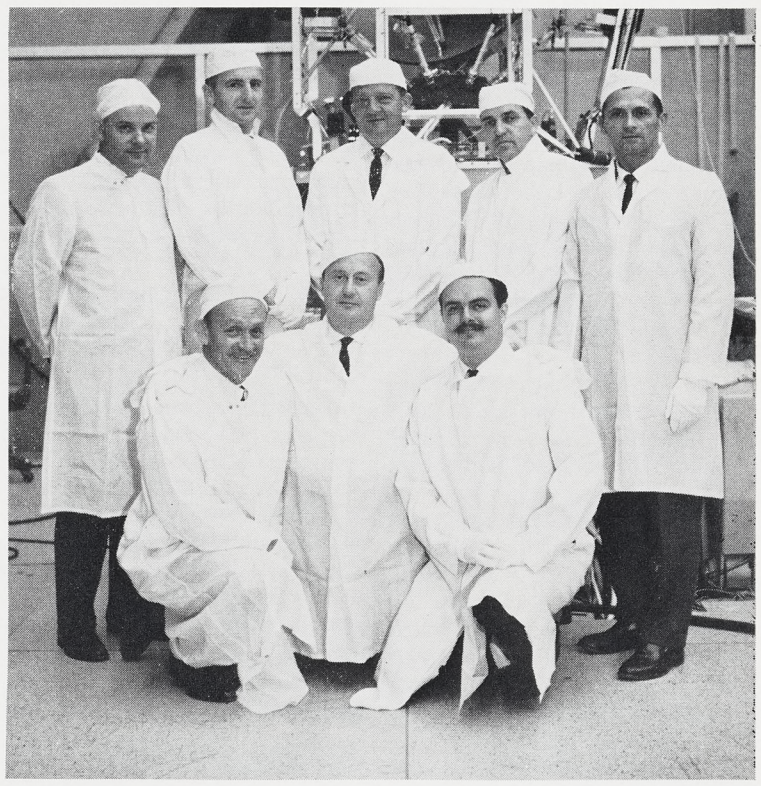
The group, however, only moves into the front line when a critical decision affecting Mariner's operation must be made by SFOF.

A good example occurred during the mid-course maneuver last December.

Six days and more than a million miles from earth, Mariner began receiving more than a score of commands from ground control on December 4. Plans called for Mariner to perform the maneuver automatically after instructions had been stored in its central computer and sequencer.

The spacecraft had acknowledged receipt of its instructions, and the countdown had begun for firing its rocket motor to change its trajectory.

Suddenly, word was received that Mariner had lost the lock on its guiding star, Canopus at the moment the mid-course maneuver had begun.



WHERE'S BEN—Part of Northrop force assigned to JPL Mariner mission, now two weeks from Mars destination, gather in PTM building. Standing (from left) are Bob Miller, Ken Laverty, Tom Laney, Sherman Scott, and Frank Orlick. Kneeling is Jack Howard, Nat Nezhni and Bill Eller. Working around PTM requires adherence to clean room conditions.

The group had been receiving inputs of pertinent data from systems on board Mariner IV. The specialists had their PTM in operation and were simulating the spacecraft's behavior.

The Mariner Flight Control group in the SFOF wanted a checkout of possible causes, using the PTM.

A number of tests were conducted in support of the decisions that were made.

The maneuver for that day was postponed and started over again early on December 5. This time the mid-course maneuver went perfectly, resulting in a bull's eye trajectory. The spacecraft will fly by Mars about 5600 miles from the surface at closest approach a little after 6 p.m. PDT on July 14.

With the most critical maneuvers of all only two weeks away, the group is already supporting the determination of the best procedure for execution by sampling alternatives on the PTM.

Critical functions can be accomplished automatically or by ground control, depending on the data returned as to how each subsystem is functioning. The decision on whether to allow Mariner to proceed automatically when it reaches Mars or turn control over to ground stations will depend partially on tests now being run by the group on its laboratory model.

The group, headed by JPL's G. Wade Earle, includes from NSL: Bob Miller, telecommunications representative, and Tom Laney mechanical and propulsion representative, and Ken Laverty, Guidance and Control representative.

Mr. Earle is a former Northrop employee.

In addition to the test direction team, NSL's industrial support group on the Mariner program includes:

Bill Ellern, environmental test engineer on Ranger and Mariner spacecraft, presently assigned as cognizant engineer on JPL's thermal vacuum environment group.

Frank Orlick, test engineer, responsible for space simulation tests of Mariner spacecraft.

Nat Nezhni, dynamics test engineer on the craft and its subsystems, presently cognizant engineer for JPL Induced Environment group. Mr. Nezhni designed, fabricated and installed special facilities required for flight vibration and shock acceptance tests.

Jack Howard, project coordinator and administrator of Northrop personnel at JPL.

Independence Day Brings Long Holiday

Independence Day, which falls during the coming weekend, will afford Northrop Corporation employees everywhere their second "long weekend" of the year.

Because July 4 occurs on Sunday, July 5, Monday will be observed as a holiday. Regular work shifts will resume July 6.

DeBuono Paper Deals With Tiny Telemeters

G. J. DeBuono, NSL Life Sciences staff member, presented a paper at the Space Electronics Symposium held late last month at the International Hotel.

Titled "Subminiature Implantable Telemeters for Biological Monitoring," Mr. DeBuono's paper dealt with the design of telemeters small enough to be implanted in tiny pocket mice for sensing and transmitting information during space flights.

Space Flight Control Meet Led by Chattler

Leo Chattler, Nortronics vice president and manager of Marine Equipment Department in Needham, Massachusetts, has been named general chairman for the Aerospace Vehicle Flight Control conference July 13-15 in Los Angeles.

The conference, sponsored jointly by the National Aeronautics and Space Administration and the Society of Automotive Engineers, will bring together aerospace executives and scientists from throughout the United States to explore new developments in the field of flight control for aircraft, missiles and space vehicles.

CAPE KENNEDY: A Northrop Catalog

(Continued from page 2)

launches of the future.

Page communications contributions extend out from Cape Kennedy to many points. Nearby is a frequency analysis and control facility for Merritt Island and a downrange UHF air to ground system. Flashing out to other distance points are troposcatters at key locations in the Bahamas. At Petoria, Africa, is a telemetry antenna feed system.

And other communications links are provided by Underseas Cable Corporation (see story on page 3).

Northrop Space Laboratories is contributing OV2 satellites. Add to this the NSL Ranger and Mariner industrial support effort.

And each NASA astronaut polished his flight proficiency in the Norair-built T-38 supersonic trainer.

"This is a basic idea of Northrop contributions," Mr. McDonald said. "Break each of these items down and you come up with countless hundreds of others."

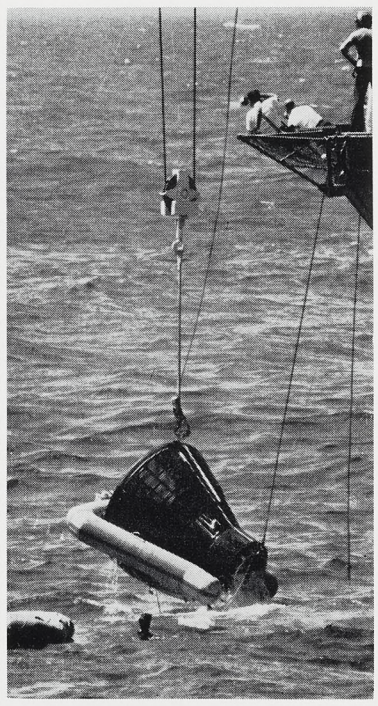
Naturally, there is the support of Cape Kennedy-based programs exercised from other points. That would be the NSL Huntsville operation as well as the Northrop-Brown and Root effort at NASA's Manned Space Center, Houston.

"Add them up any way you like, the total is impressive and extensive," Mr. McDonald noted.

Northrop will help Cape Kennedy, *nee* Cape Canaveral, celebrate the 15th anniversary of the first rocket launch from the Florida base July 24.

The first Northrop expedition departed for the Cape 13 years ago on the Snark missile project in what was to become a series of pioneering accomplishments.

Helicopter picks up one of Gemini IV astronauts from Atlantic Ocean after splashdown.



Aircraft carrier WASP prepares to hoist capsule which orbited the earth 62 times.

Zero Defects Program Launched at Norair

More than 7000 employees at Hawthorne and in the Antelope Valley joined two million persons across the nation last week in working toward Zero Defects.

The Northrop program, which began at Nortronics Precision Products Department, Norwood, Massachusetts, last winter, has been expanded to include Norair and Northrop Space Laboratories.

Kickoff ceremonies at Palmdale were held June 21 when employees from Edwards AFB joined those from the Palmdale facilities for briefings by top Northrop executives.

The following day, Norair and NSL shut down operations at 1 p.m. to gather in a newly erected stadium adjacent to Hawthorne Municipal Airport.

Key speakers were the Honorable G. E. Fouch, deputy assistant secretary of defense; Lieutenant General T. P. Gerrity, Air Force deputy chief of staff; Brigadier General J. A. Pechuls, deputy chief of staff of Air Training Command; Northrop President and Chairman Thomas V. Jones; Vice President and Norair General Manager Richard E. Horner.

Senior Vice President Richard R. Nolan was master of ceremonies.

Northrop set a precedent in its West Coast inauguration of ZD by inviting representatives of nearly 250 of its major supplier companies to participate in the program.

Approximately 500 heads of these companies and their deputies came from throughout the United States and Canada for a morning briefing on how to install ZD programs of their own. They were also special guests at the afternoon ceremonies.

At the afternoon ceremonies, employees learned that the ZD program encourages employees personally to prevent errors at their origin.

Training and education programs, as well as incentives, will be provided by Northrop to help sustain permanent momentum for ZD.

It was strongly emphasized that the new program is designed to complement the CMIP program rather than replace it.

According to Mr. Fouch:

" . . . In brief, Zero Defects recognizes the man, the woman, the person. It strips away anonymity. It helps make it possible for each person to come and go from our work daily with a sense of satisfaction and conviction that what is being done is worth doing."

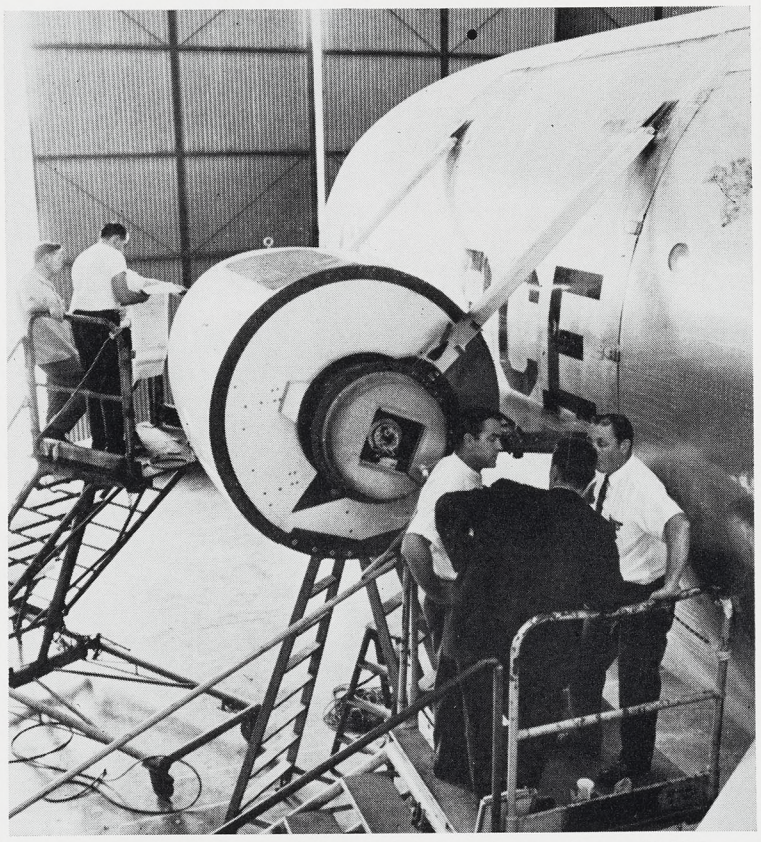
Malm Elected VP At Page Engineers

Dr. Robert E. Malm, director of Research and Development, has been elected a vice president of Page Communications Engineers, it was announced last week in Washington by Joseph A. Waldschmitt, president of the Northrop subsidiary.

As director of Research and Development, Dr. Malm is responsible for a broad spectrum of technical activity aimed at developing new system concepts and advancing the state-of-the-art in communications technologies.

Interest earned from your investment in U.S. Savings Bonds is not subject to state or local income taxes. Federal tax on E Bond interest may be deferred until you cash the bond.

NEARLY AIRBORNE



Nortronics-developed Airborne Lightweight Optical Tracking System (ALOTS), up to now tested only from ground stations, is presently being mounted on modified Lockheed cargo plane. Modifications and installation are in progress at Ontario Airport.

SYMPOSIUM PROBES PROSPECTS FOR CHECKOUT EQUIPMENT

Four Nortronics (Anaheim) technical experts from the Automatic Test Equipment section were active participants this month in a symposium sponsored in St. Louis by the Institute of Electrical and Electronic Engineers.

Will Peterson, director of the Anaheim section, was a session chairman. Papers were presented by John Shore, Noble Bishop and Irving Shedd.

The June 7, 8 and 9 symposium was on Automatic Support Systems for Advanced Maintainability and was hosted by Emerson Electric.

Nortronics is a leading developer and producer of automatic checkout equipment for the U.S. Navy.

Also attending the symposium from Nortronics were Paul Boggess of the Automatic Test Equipment section and E. J. Norman of the Marketing staff.

Put the pleasure of purchasing power in your future. Buy U.S. Savings Bonds today, where you work or bank, for security tomorrow.

Bright Future Predicted for Space Labs

Northrop's future in the space business is looking increasingly bright, according to Roy Jackson, vice president and assistant general manager of Northrop Space Laboratories.

Mr. Jackson

Featured speaker at the June meeting of the Northrop Norair Management Club, Mr. Jackson said, "We are most confident that we will get Northrop into the space business in a substantial way.

"We are doing well in competition," Mr. Jackson told the crowd of 326 executives. Looking to the future, he said, "We are pursuing areas of technical capability where we feel we offer something other companies don't."

Its achievements to date and plans for the future are in keeping with NSL's stated objective, Mr. Jackson said. This is, basically, to see that Northrop gets its fair share of available space vehicle business.

Describing the work currently going on at NSL, Mr. Jackson divided it into two areas: Research Laboratories and System Programs. Each of these contain two major areas—Life Sciences and Physical Sciences for the former; NASA and USAF for the latter.

NSL's Life Sciences research is directed toward man-in-space, his protection and his performance, and life-in-space, its existence and noncontamination. Mr.

(See JACKSON, page 5)

PIONEERS IN PARADYNAMICS: Part 2

What Goes Up Must Come Down—But Gently Please

By a Staff Writer

On its way to a perfect landing early this month, the Gemini IV space capsule passed Ed Ewing somewhere in the wild blue skies near the upper reaches of the earth's atmosphere.

That's where the earth's atmosphere is closest to simulating the environment in which future astronauts will have to land when they reach Mars.

That's where Mr. Ewing's thoughts are these days when he has a spare moment in his busy schedule as a research engineer at Northrop Ventura's Paradynamics Lab.

Mr. Ewing, who invented the Ringsail parachute which returned Gemini IV from its unprecedented 62-orbit flight, is one soft voice in favor of parachute landing systems on interplanetary spacecraft.

The canopy which he believes can do the job is now in development at Northrop Ventura for another purpose, but chances are pretty good he'll get an opportunity to test it in the low density atmosphere between 20,000 and 150,000 feet. That would be an approximate simulation of Martian conditions.

But a Martian landing is only one thought in Ed's inventive mind, which has been consistently productive for Northrop Ventura since 1947.

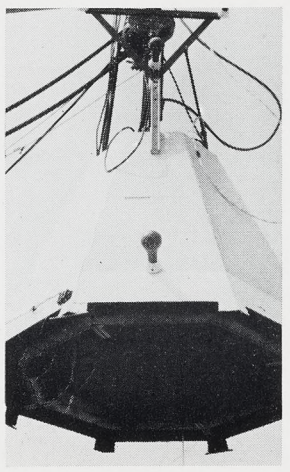
A former vice president of the Pacific Rocket Society, Mr. Ewing never lost interest in rocketry (he terms it an "avocation").

For the past couple of years he has been testing combination skirt jet-parachute landing systems, and this is one of the two concepts he feels will dominate the next era of recovery.

The skirt jet is a ring of small rocket nozzles which may be mounted on the bottom perimeter of a space vehicle. The concept involves using a smaller parachute, allowing the craft to descend faster, and firing the rockets a few feet from the ground for terminal deceleration.

The advantages, Mr. Ewing points out, are safer landing, greater accuracy through reduction in drift and, most

(See PIONEER, page 5)



Ewing children—Jimmy, Diane and Tommy—learn about rockets and parachutes from Dad, who is pioneer in both fields, in candid photo taken by Mom. At right is mockup spacecraft fitted with Ewing skirt jet on its base.

EDITOR'S NOTE: The NEWS asked Mrs. Ed Ewing, who is editor of the Conejo News "Living" page, to provide our readers with some insights as to what family life is like with a contemporary inventor.

By Maida Ewing

When one's husband is an inventor and designer with visionary tendencies, the usual domestic workload multiplies. As the lesser half of Edgar Ewing, I have found added to my role of housewife and mother the following assortment of tasks.

—Sewing experimental parachute models.

—Typing and retyping seemingly endless technical papers and engineering proposals.

—Playing secretary to his position as vice president of a rocket society.

—Being custodian of a mountainous library of science fiction.

—Going along on experimental rocket tests in the Mojave in 120 degree weather and "housekeeping" under the stars with rats and snakes.

—Being "guinea pig" auditor to provide first reactions for a new gadget or scientific theory.

But the time I remember most vividly was when he called me one Sunday noon in 1958 to say, "I'm down."

With cloak and dagger secrecy, he arranged to make the first overland jump with his newest "baby" the Skysail parachute and him with no previous jumping experience.

When the space explorer returned home, bruised but happy, he placated me with: "Once is enough, but I had to do it. I had faith in the chute and wanted to feel first hand the sensations a parachute jumper experiences. Testing my own chute gave me a legitimate excuse to find out."

It wasn't until then I found that while I thought him "out in the shop working," he had been rigidly exercising and training for the jump and boning up on how it is done. I still wonder today what I would have done had I seen him climb into the Skydiver's jump plane with the parachute on his back.

(See MAIDA, page 5)

Tactical Tests In Progress For Fighters

An extensive Air Force operational evaluation on the Northrop-built F-5 fighter is currently in progress at Eglin Air Force Base, Florida.

It is called Project Sparrow Hawk.

Performed by the USAF Tactical Air Warfare Center, this effort will demonstrate air-to-ground capabilities in a tactical fighter mission environment.

Six F-5s are involved, along with six Air Force F-4c "Phantom IIs" and six U.S. Navy "Skyhawks."

Flying the six F-5s in the project are seven veteran Air Force pilots. They received their check-out training recently at Williams AFB, Arizona, then ferried the fighters to Eglin AFB.

Maintenance is being provided by Air Force crews also trained recently at Williams AFB.

Thus, the Air Force evaluation will also provide a true picture of how well maintenance personnel can service the F-5 after receiving only minimum programmed training. Another key Sparrow Hawk objective is to determine exactly what it takes to support the F-5 under conditions of a simulated forward operating base.

For the measurement of weapons delivery, instrumented ranges at Eglin AFB are being utilized to record impact points in feet from standard references.

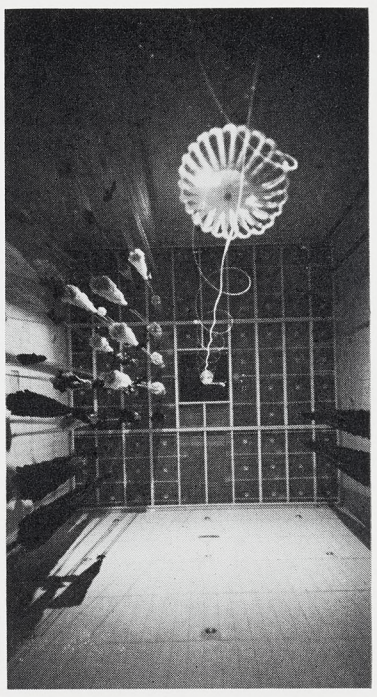
Directing Norair's efforts in support of Project Sparrow Hawk is L. A. Nelson.

Mr. Nelson pointed out that the program is an Air Force operation from start to finish under direction of the Tactical Air Command.

"Northrop is providing support, as requested, just as it would under operational conditions," Mr. Nelson said. "Naturally, we are keeping abreast of day-to-day results for future applications. To date, we have been well pleased with the performance of the F-5s."

Customer contact at Eglin AFB falls to Harry R. Evans, while J. J. Quinn handles feedback of information at Hawthorne for use of the project director, Marketing and Customer Relations.

Four Northrop technical representatives reporting to Gaylord Anderson of Product Support are on hand at Eglin AFB. They are D. R. Heywood, I. M. Houts, C. E. Johnson and Jim Bateson.



Rotafoil parachute, one of Ed Ewing's early inventions, is shown dropping in test chamber at El Centro in this decade-old photo.

MAIDA

(Continued from Page 4)

When I first met the man in the late 1940's (when astronautics was thought to be one step beyond the fantastic), rather than spend an afternoon at the beach with his bride-to-be, he was occupied with building a 10-foot model of a lunar spacecraft for the Pacific Rocket Society. Specifications of the rocket are still considered prophetic of post-Apollo developments.

Mrs. Ewing

When Ed designed the Ringsail he little dreamed it would be used to bring the Mercury space flights to a safe landing. Al Shepard's exuberant report, "It's a beautiful sight," moved him greatly, and each astronaut in turn has echoed those words.

As an inventor he constantly sees what can be done better and easier, and does it. Retiring to a complete workshop is his idea of heaven.

His newest "at home" project is designing a better surfboard. He tried one at Waikiki last year and found the boards being used more unwieldy than those he had made as a surfing youth. My only reservation is that this, like his parachute, will have to be tested, and I'll bet he has in mind doing it himself.

PIONEER

(Continued from Page 4)

important, the ability to land softly on rough terrain.

There are advantages over conventional retro-rockets, too.

"Such retro-rockets tend to blast furrows in the surface," he said, "and debris from the furrow is thrown back against the descending vehicle.

"The annular rockets of the skirt jet, first of all, do not need as much thrust because of ground effect cushioning and, secondly, they direct the jet flow outward away from the vehicle causing any debris to be thrown off to the side."

Mr. Ewing's (patent applied for) skirt jet could be used for spacecraft landing on soft surfaces, such as may be found on the moon, without the rocket power digging its own grave.

"The success of this type of LEM landing system does not depend on our having accurate knowledge of the lunar surface," he said.

Another leading candidate for landing systems of the future is a deployable gliding parachute of advanced design. The goal is a parachute system which will glide forward three to four feet for every one foot of descent.

If nylon and rockets seem an unlikely mix of materials for an inventor, consider some of Ed's other design contributions to recovery technology. There's an ejection mortar for parachutes, an explosive hatch ejector, a landing shock absorber, and a high pressure press for packing parachutes.

One of his earliest inventions, a Rotafoil parachute, is still used by Northrop Ventura for recovery of one of its target drones (RP-76). This design was for a fast spinning canopy giving extra drag and stability.

Mr. Ewing calls for an end to the discomfort of ocean landings for astronauts.

"A more dignified conclusion to such flights can be effected on any local airstrip with the Northrop Ventura gliding parachute and skirt jet landing systems," he said.

Maybe Ed is still thinking about his first and only jump but, regardless of the motivation, it appears obvious he is determined to make returning from outer space a safer and more comfortable experience for astronauts.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:30 a.m. — 4:15 p.m.

Highland & Marine, Manhattan Beach. L. Berg, ext. 2763, 672-5578. 3

8 a.m. — 4:45 p.m.

Main & Carson, Torrance. C. H. Vance, ext. 2313, 835-1031. 5

Rides Offered

8 a.m. — 4:45 p.m.

Main & Carson, Torrance. C. H. Vance, ext. 2313, 835-1031. 15

JACKSON

(Continued from page 4)

Jackson described experiments being conducted and special equipment developed and used in these efforts.

Studies in Physical Sciences center on materials in the space environment, concentrating on problems from vacuum, radiation, meteoritic impact, and re-entry. Among several highly advanced research "tools" used in this work are NSL's man-rated space chamber, TRIGA nuclear reactor, and plasma facility.

Systems programs described by Mr. Jackson included those for possible lunar and planetary exploration, for which NSL engineers have developed a vehicle with a unique mobility and suspension system.

He also reported on the status of the OV2 satellite program. NSL has developed and built one of these low-cost spacecraft and is working on the second. Developed under a fixed price contract, they represent a new approach to the production of space exploration vehicles. NSL is also conducting classified programs for the military that have significant potential.

Koletty Graduates From West Point

John W. Koletty jr., son of Colonel John W. (Jack) Koletty of Nortronics Marketing staff, graduated from the U.S. Military Academy this month.

Colonel Koletty (U.S. Army, retired) and Mrs. Koletty attended the graduation ceremonies and the wedding of the young second lieutenant which followed.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Refrigerator, Philco, 5′, about 7-yrs.-old, $50. Inglewood, 672-5578. A

Automobile Year, vo's. 1, 4, 5, 6, 7, 8, 9, $35. Costa Mesa, 545-3611. A

Chair set, 4 hvy. maple, captains, $34. Fullerton, LA 5-2767. A

Range, Crosley, elec., standard size, deep well cooker, $25. Torrance, 375-1756. A

Top Hamper, large size for auto, $15. L.A., 754-4384. A

Bed, single, wooden headboards; springs & mattress, $10. Box 1001. A

Mobile Home, 1964 Universal, 12x55 w/ living & dining rm. ext., 1-bdrm., furn., porch, awning, air cooler, $1300 dn. & take over pymts., $6428 bal. Anaheim, 772-5754.

Stove, 42″ Wedgewood Kook Center, yellow w/chrome top, 5-burner, oven & broiler, rotisserie, $150. Garden Grove, 537-6760. A

Renault Dauphine, 1960, recent o/haul, good tires, $395. Palos Verdes Est., FR 5-3202. A

Buick LeSabre, 1962 4-dr., sed., $2100. L.A., AX 4-1249. A

Swim Pool, Doughboy, 15′ x 36″, incl. vacuum & filter, $35. Torrance, DA 6-0340. A

Sloop, 24′ Herrshoff, 1961, built by Master Shipwright, teak decks, sleeps 3-5, inbd. eng., full cover, fully equipped, $6000. San Pedro, TE 3-5037. A

T-Bird, 1955, h/top, p/seats, p/wind, auto. trans., $900. Inglewood, 671-1879. A

House, 3-bdrm., 1-yr.-old, w/ocean & mountain view, family room, many extras, $33,800. Palos Verdes Pen., 377-5172. A

Sport Parachute, 28′ main, 5-panel TU, 20 jumps, 24′ reserve, $35. L.A., 477-9397.

Camp Trailer, 1960, Terry, 15′, $895. Torrance, 371-4876. A

Acreage, lake front, $3500 acre. Manhattan Bch., FR 8-2943. A

House, 4-bdrm., 2-bath, view, 15x30 patio, block wall, landscaped. Accept low down pymt. & 2nd trust deed, $21,500. Thousand Oaks, 805-495-3801.

Truck, International, 1951, ½-ton, p/s, new tires, 19,000 miles, $1100. Redondo Bch., FR 6-6415.

Wanted to Buy

Blower, VS 57 Paxton, used or rebit. Whittier, OX 3-4117. B

For Sale or Trade

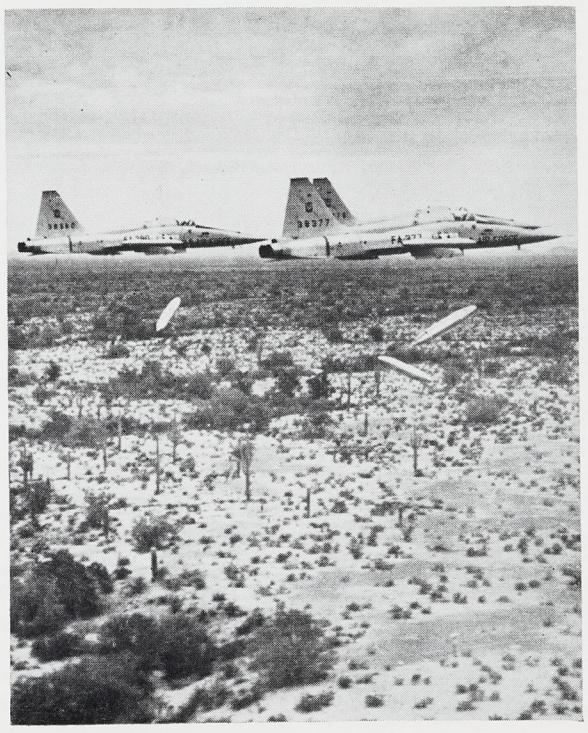
Corvair Monza, 1962 4-dr., r/h, auto., b/s, 1-owner, $975 or trade for late Cadillac. Alhambra, AT 4-5698. M

Falcon station wagon, 1960, 4-dr., r/h, w/w, luggage rack, stick shift, 1-owner, $800 or trade for 1962, 1963 Ranchero. Ventura, 805-643-9413. M

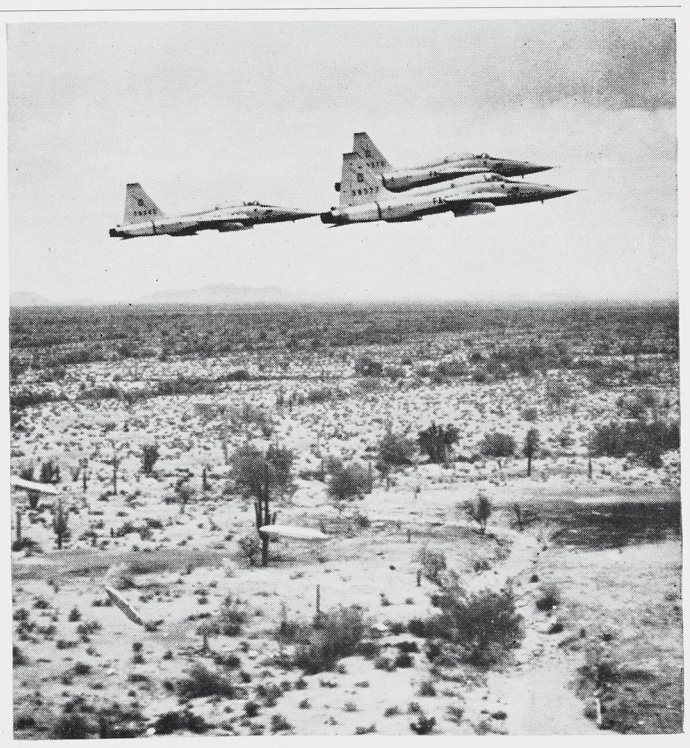
Encyclopaedia Britannica, my $250 equity for 35mm slide projector/screen or power edger. Palos Verdes Ests., FR 5-5097. M

Boys and girls who buy U.S. Saving Stamps easily learn a lifetime lesson of thrift with trust—on sale at many schools and all post offices at 10, 25 cents and up.

Moving in for Kill . . .



Pilots Deliver Their Bombs . . .



Another Sparrow Hawk Hit

Water Sportsmen Focus on National Safe Boating Week

Northrop recreation clubs devoted to water sports joined this week in endorsing the aims of National Safe Boating Week (July 4-10), recently proclaimed by President Johnson.

Captain Walter Curwen, the Coast Guard's Search and Rescue Operations chief for Southern California, has noted 75 per cent of salt water boating accidents in the area occur in the "terror triangle" between Newport Beach, Catalina and Santa Barbara.

He suggests each boat owner comply with all of the following recommendations, if they operate on salt water.

1. Carry a marine radio capable of operating on 2182 kilocycles, the international distress frequency. Do not substitute Citizens Band equipment. The Coast Guard does not monitor the latter.
2. Take one of the safe boating courses offered by the Coast Guard Auxiliary, American Red Cross, U.S. Power Squadron, etc.
3. Carry an inflatable life raft.
4. Have your boat inspected once each year by the U.S. Coast Guard Auxiliary, or Coast Guard "boarding teams."

Safe Boating Week programs are planned July 10 in Santa Barbara; July 10 at Marina Del Rey; July 3-5 at Redondo Beach; and at times to be announced locally at Newport Beach and Long Beach.

HAZARDS

(Continued from page 1)

is also responsible for the interpretation of local, state and national safety regulations on hazardous materials; investigation of accidents; and serving as the Division's chief watchdog in seeing that regulations are followed.

In addition to Mr. Binsacca, the committee includes: Don Archer of Industrial Relations; E. G. Clark of Experimental Operations, C. W. Corder of Plant Engineering, J. E. Evans of Test Engineering, Dr. Ted Hallman, Advanced Technology, R. A. Iehl of Production Operations, G. E. Johnson of Quality Control, and John Steman of Safety and Security.

THE BEAUTY OF IT ALL

Exchanging latest information on the Gemini IV mission early this month, while enjoying a little open space themselves, are Bob Whalen, Pat Rouse and Vicky Schreiner (left to right). Northrop Ventura administration building is in background.

NEW DRONE: Project Gets Off Ground in 3 Months

(Continued from page 1)

of off-the-shelf components with which the project team is thoroughly familiar, according to Mr. Conner.

Bob Johnston is lead design engineer and Bill Dedon is lead analytical engineer in a project organization which, in effect, "focuses attention on the NV-105 as if it were the only program within the Division but without interferring with other programs handled by Ed Burd's Aeronautical Engineering group."

The engineers on the project are Wayne Wadington, Don Peck, R. Bottum, Anthony Polikaitis, John Clark, Richard Cronin, Larry Parsons, George Webb, Bill Dedon, Marvin Schuler, Jack Fischer, Robert Kinzy, J. Rashid, J. Gurule, R. Erikson, Dean Borgman, Joe Letteriello, Lawrence Lyon, Robert Lochemes, Sherwood Le Roy, Tom Lucero, and Sheldon Dockswell.

Wind tunnel tests are scheduled the second and third weeks of July at Northrop Norair. Demonstration vehicles and the full scale wind tunnel model are being fabricated by Experimental Operations under the direction of Earl Clark with assistance from Jimmy Johnson, Dick House, and Blair Chapman.

Colonel Keeling Takes AFPR Post

Lieutenant Colonel Charles W. Clark, Northrop Corporation Air Plant representative since May 1961 departed last week for a new duty assignment. He has been succeeded by Lieutenant Colonel Rufus K. Keeling.

Colonel Clark has reported to the C-5 System Program Officer, Aeronautical Systems Division, Air Force Systems Command, at Wright-Patterson AFB, Ohio. Colonel Keeling has served as chief of the Titan III Procurement Directorate with the Deputy Command for Manned Systems, Space Systems Division, AFSC. He is a veteran of more than 21 years in the Air Force.

Softball Action Starts Tonight for Venturans

THE SCHEDULE

Northrop Ventura's softball nine will play eight games this season on Wednesday evenings at 6:30. All games will be played at Thousand Oaks High School.

The schedule:

June 30: Westinghouse
July 7: California Lutheran College
July 14: Newbury Park
July 21: Fraternal Order of Eagles
August 4: Westinghouse
August 11: California Lutheran College
August 18: Newbury Park
August 25: Fraternal Order of Eagles

Northrop Ventura opens the regular season softball action tonight at 6:30 at Thousand Oaks High School stadium in a game against its Newbury Park neighbor, Westinghouse.

Eight games will be played in the Class AA league, which will be shooting for the Conejo Valley playoffs in early September.

Fifteen Venturans have responded to the player call by Manager Chuck Taylor.

"Considering the amount of practice we have had and the average age (33) of team members, we have shown remarkable improvement this month," Mr. Taylor said.

Mr. Taylor

The veteran player-manager pointed out that the team lost its first exhibition game 17-0, the second 6-0, and won their third 7-0.

Last month Northrop Ventura fielded two teams, one in the Conejo Valley league and one in the San Fernando Valley league.

Since most of the team members now live in the Conejo Valley, the Division is putting all its guns into one lineup this year.

The squad for the opening game includes:

Chuck Taylor, manager and catcher
Dean Haddon, pitcher
Dave Coe, first base and assistant manager
Bill Higgenbotham, second base
Don Keller, shortstop
Don Rondeau, third base
Buz Correy, leftfield
Joe Letteriello, centerfield
Tom Payne, rightfield
Tom Howe, outfield
Lou Dumond, outfield
Ron Lancaster, infield
John Gurule, infield
Dean Borgman, outfield
John Schaeffer, outfield

LIFTING BODY

(Continued from page 1)

and landing. Initial drops will be made at 45,000 feet altitude and at about 530 miles per hour ground speed.

The vehicle, 22 feet long and nearly 10 feet wide at its tail fins, weighs 4600 pounds empty. Its internal tanks can carry water ballast to bring the weight to more than 8000 pounds.

Principal speaker at the ceremony was Milton B. Ames, jr., director, Space Vehicle Division, in NASA's Office of Advanced Research and Technology. Richard E. Horner, Northrop senior vice president and general manager of Northrop Norair, officially transferred the vehicle to NASA.

It was accepted by Paul F. Bikle, director of NASA's Flight Research Center at Edwards, California, who will direct the flight test program.

The first two M2-F2 pilots will be NASA's Milton Thompson, famed as a pilot of the X-15, and Captain Jerauld R. Gentry of the Air Force Flight Test Center, Edwards Air Force Base, California.

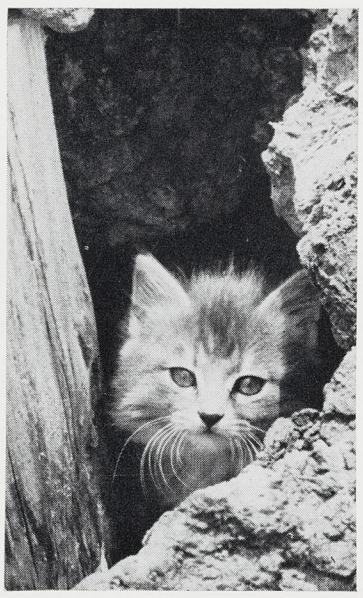
A few hours after the rollout ceremony, the M2-F2 was transported to the Flight Research Center for further instrumentation and instrument calibration. Next it will go to NASA's Ames Research Center, California, for wind tunnel testing. Flight tests are expected to begin next fall at the Flight Research Center.

Protection of principal and guaranteed interest are available to wise investors in "Series H" U.S. Savings Bonds. From $500 to $10,000 in denomination, the "H" Bond earns 3¾ percent, when held to 10-year maturity. Interest is paid by Treasury check twice a year.

Kittens Vie With Water For Pitter-Patter Rights

Six little kittens are going to get their mittens wet unless they find new living quarters pretty quick.

Mamma cat, an established resident at Northrop Ventura, happened to pick for her maternity ward a miniature rocky cavern below the water level of a drained, man-made moat which extends the length of the Division's mall area.



Great while it lasted.

The waterway had been drained for its annual spring cleanup, according to Industrial Relations Director Rex Fairless.

First indication that the clean-up was not going as expected came as employees on a noontime stroll were stopped in their tracks by the sight of the mother and her six fledglings making their first public appearance by strolling up and down the stream's dry bed.

Now that the kittens are "at their cutest age," as one adoring secretary put it, plant maintenance people face a growing public support for the feline population.

"We're hoping they'll go away of their own accord," John Steman, chief of Plant Security and Facilities, said.

Page Engineers Designs Advanced Ground Terminal

Page Communications Engineers has announced the development of a new satellite communications ground terminal of advanced design.

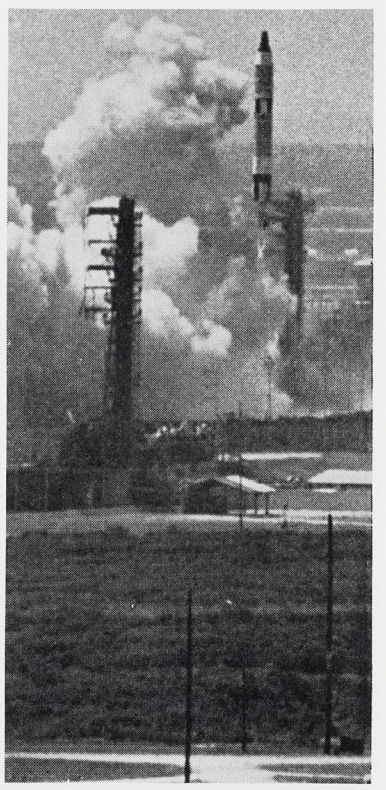
The terminal prototype, at the Page test facility on the Chesapeake Bay, is performing tests with the Relay satellite.

Readily transportable by air, land or sea, the Page terminal can be set up and operational on short notice anywhere in the world. The main feature of the terminal is its highly efficient receiving system—usually the limiting factor in satellite communications systems.

The relative simplicity of the system's electrical and electronic equipment and its ease of operation are highly important factors, especially when used in remote locations.

Complete with a fully automatic tracking capability, the Page satellite communications terminal is designed to operate in the civilian satellite communications frequency band. The terminal can be modified however for operation in any of the satellite communications bands.

"A pioneer and world leader in communications systems technology, design, management and operation, Page has greatly advanced the state-of-the-art in satellite communications ground terminals by this latest company-funded R&D program," according to the announcement by Joseph A. Waldschmitt, president of the Northrop subsidiary.



Titan-III launch vehicle sends Gemini IV into orbit (other photos on page 2, 3).

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 11 | July 14, 1965

Hawthorne Data Link Completed

Northrop is speeding computer to computer communication between Ventura Division and Hawthorne by Broadband Exchange Service provided by Western Union.

Northrop is initially using the Broadband Service to handle heavy loads of data traffic between its main Data Processing complex at Hawthorne and Newbury Park.

Two Broadband Exchange stations at Hawthorne and one at Newbury Park will be connected into Western Union's Los Angeles Broadband Exchange where the circuit switching will be performed.

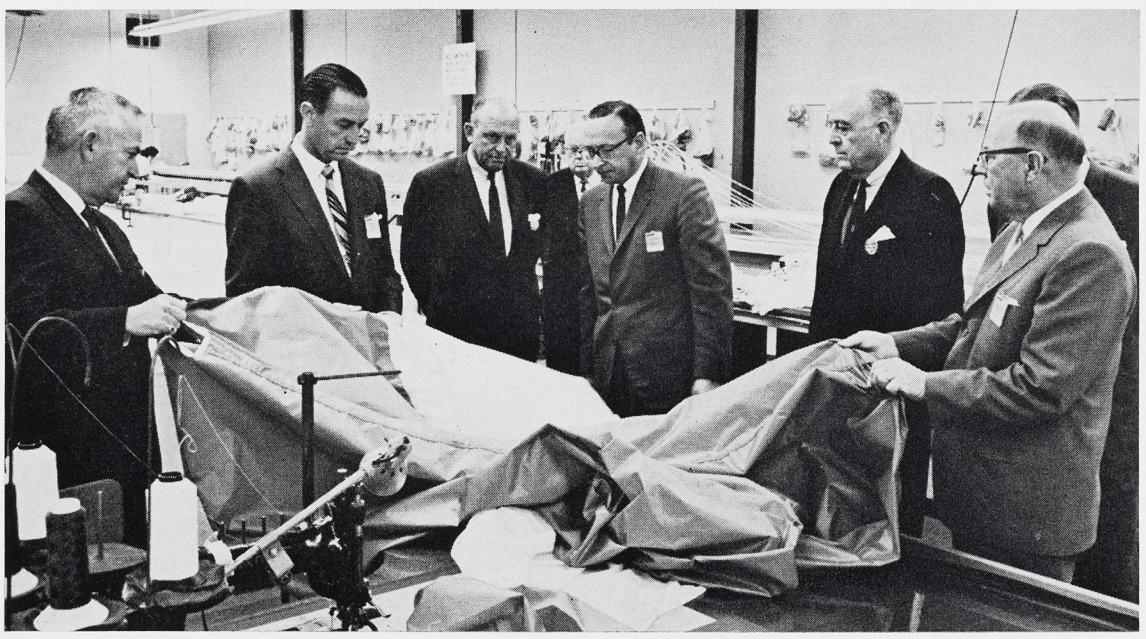
Besides its full-time Broadband stations and call-up connections with facilities in Southern California, Northrop has communications access to all subscribers served by Broadband Exchange Service throughout the country.

The service permits subscribers to select automatically—through a unique Western Union telephone—channels for the two-way transmission of data, facsimile and alternate voice communications on a call-up basis.

F. N. Walensky and L. R. Williamson are supervisors of Programming and Operations, respectively, at Northrop Ventura.

Paul Wierk, Corporate director of Management Information, is responsible for all Data Processing services.

BOARD OF DIRECTORS MEET AT VENTURA



Northrop board of directors met at Ventura Division last month in regular business session, complemented by tour which included Paradynamics lab. Most board meetings are held at the Corporate office, but periodically the directors convene at other Northrop facilities. From left are George F. Douglas, Corporate vice president and general manager, Ventura Division; Thomas V. Jones, Northrop president and chairman of the board; Robert R. Miller, senior vice president—Corporate Relations and a director; John O'Melveny, director; M. A. Maurer, vice president and manager, Ventura Production Operations; Richard W. Millar, director; James Allen, Corporate vice president and assistant to the president and a director (partially obscured); and A. E. Ponting, director.

Agreement With French Firm Told

Northrop Ventura, producer of landing and recovery systems for all of America's manned space vehicles, will provide technical data and know-how to Aerazur Constructions Aeronautiques of France under a technical assistance agreement announced this week.

The agreement is subject to the approval of both the French and American governments.

The announcement was made by George F. Douglas, vice president and general manager of Northrop's Ventura Division where the parachute landing systems were produced for the Mercury and Gemini programs, and are under development for earth landing of the Apollo moon flight vehicle.

Mr. Douglas said Stiles T. Burke, a veteran administrator with 14 years of service with Northrop, will serve as management representative at Aerazur while details of the joint operation are being worked out for ensuing operations.

Northrop will assist Aerazur in the field of paradynamics and space re-entry, including research, development and production of complete systems. Aerazur is the leading French company in this field.

More Suggestions

Northrop Ventura employees submitted 310 suggestions during the six months period ended June 30, compared to 260 for the same period in 1964, it was announced last week by the Employee Suggestion Award committee.

NEWS SURVEY SHOWS

Employees Want to Know More

The whys and wherefores of company objectives, information on employee benefit programs, and injection of humor were major requests of Northrop employees in a survey of 1300 persons on what they liked and disliked about the NORTHROP NEWS.

Questionnaires, containing six questions on readership habits and 16 story categories for evaluation, were distributed last March at all West Coast facilities of Northrop.

Nearly 1000 replies were received from all levels of employees.

The survey, conducted by an objective source outside the company for the Industrial Relations and Public Relations departments, concluded that: "Over all, the newspaper as it now stands seems to be a huge success with almost all employees . . ."

One of the most common suggestions made for improving the paper was for inclusion of more information on company objectives and the direction in which the company is going.

Work is already in progress to satisfy another major request — for more information on employee benefit programs.

(As for humor, the NEWS is constantly on the lookout for light news and features and invites employees who are interested in contributing cartoons on a continuing basis to submit samples).

A fourth major subject of comment — which depends a great deal on specific suggestions to the NEWS staff by employees — was features on fellow employees.

Completed questionnaires also expressed interest in knowing more about corporate officers who, by the nature of their work, frequently seem remote from divisional activities.

The detailed survey is now being reviewed by members of management, both divisional and corporate.

The NORTHROP NEWS began publication in three editions (one for each division) by the Corporate Public Relations department last February. The Industrial Relations staff serves as advisors.

While we're talking about ourselves, the NEWS would like to answer the hundreds of inquiries it has received about Editor Charles Bradford, who has been ill.

Mr. Bradford has been released from the hospital and is recuperating at his home.

Closing of Conejo Airport Prompts Study by County

The Ventura County Board of Supervisors has asked owners of the Conejo Valley airport to delay closing the facility pending a thorough study and public hearings.

The move was made following a preliminary hearing June 22 during which Northrop Ventura and other industry and private users voiced concern over an announced October 1 shutdown of the strip without a suitable alternate location.

Less than a mile from the Northrop Ventura facility, the airstrip is owned and operated by the Janss Corporation, land developers.

Director of Flight Operations Dale Johnson has been named to represent local industry on a three-man advisory committee appointed by County Supervisor John Montgomery.

Supervisors announced that hearings will begin in August on a study of an over-all airport system for Ventura County.

Mr. Tipton

Mr. Johnson

According to Mr. Johnson, there are two major proposals at present:

(1) Build up the existing Ventura County airport at nearby Oxnard to include adequate navigation equipment for all-weather flying. Oxnard's location on the coast makes it susceptible to frequent coastal stratus.

(2) Build a system of satellite fields around the Ventura County airport at Oxnard or elsewhere.

Attorney Frank Tipton, assistant corporate legal counsel for Northrop Ventura, advised the Board of Supervisors at the June 22 hearing that "closing the airport would work a hardship on Northrop Ventura."

M-C SCHOLARSHIP RECIPIENT NAMED

Jon B. Hertzog of Stockton, California, has been named the first recipient of the annual Northrop Ventura Management Club scholarship at Ventura Junior College.

Ventura College set up the scholarship fund after the Northrop club presented the school a $1000 check last December. Interest from the invested $1000 will be used for the annual scholarship.

Another $1000 grant was made by the Club in December to San Fernando Junior College.

NEW ENGINES BOOST F-5 TAKE-OFF PERFORMANCE

Details of a Northrop F-5 tactical fighter equipped with J-85-15 engines providing substantial and significant improvements in take-off performance, rate of climb and short field load carrying capability have been made public recently.

The Air Force is currently flying this aircraft, which is known unofficially as the F-5(-15).

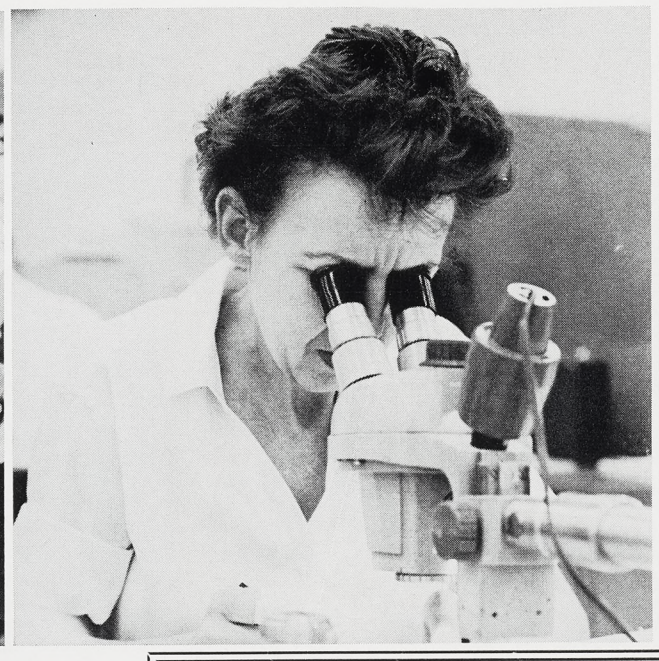
The "dash 15" refers to the new J-85-15 jet engines, built by General Electric. Other additions include the use of take-off doors to provide increased air flow and a two-position nose gear raising the F-5(-15)'s take-off attitude three degrees.

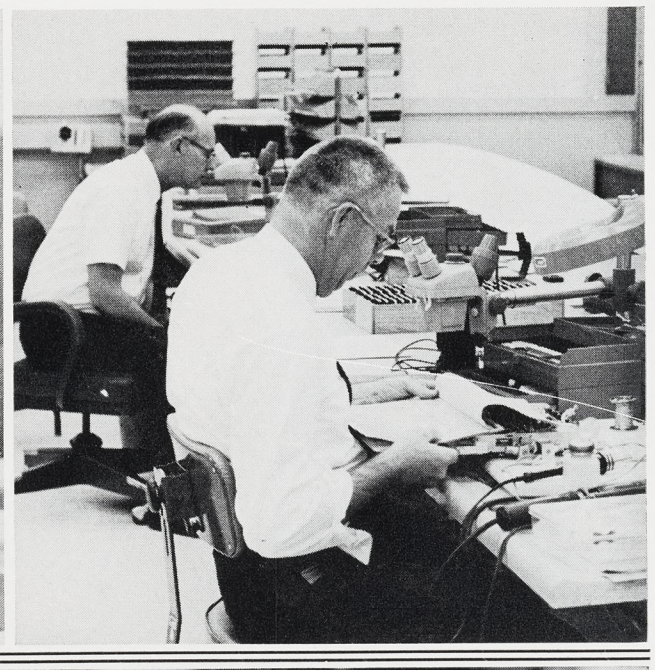
These changes have resulted in improved take-off ground roll of up to 33 percent and, more important, made it possible for the F-5(-15) to lift approximately twice as much payload as the standard F-5 in operating from short runways.

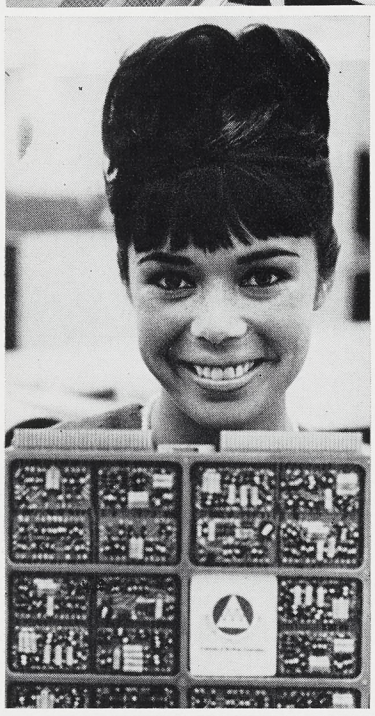
A flight program carried out at Edwards AFB and Eglin AFB, Florida, has shown the F-5(-15) capable of taking off at distances ranging from 1800 feet to 4800 feet at take-off weights between 13,000 pounds and a maximum gross take-off weight of 20,000 pounds. In interceptor configuration, the F-5(-15) provides a rate of climb of 37,000 feet per minute, approximately 7000 feet per minute more than the standard F-5. Standard F-5s are powered with J-85-13 engines developing 4080 pounds of thrust each, while the J-85-15 develops 4300 pounds of thrust. The engines weigh the same.

W. J. Tebo has served as program director for this project, reporting to W. E. Woolwine, manager, F-5/T-38 Program department.

Modification work was performed in Norair's Advanced Production and Edwards AFB facilities. Bob Elder, director of Flight Operations, made the initial flight, while Jack Wells, chief test pilot, carried out the majority of Northrop-conducted flight tests prior to the beginning of Air Force testing operations.

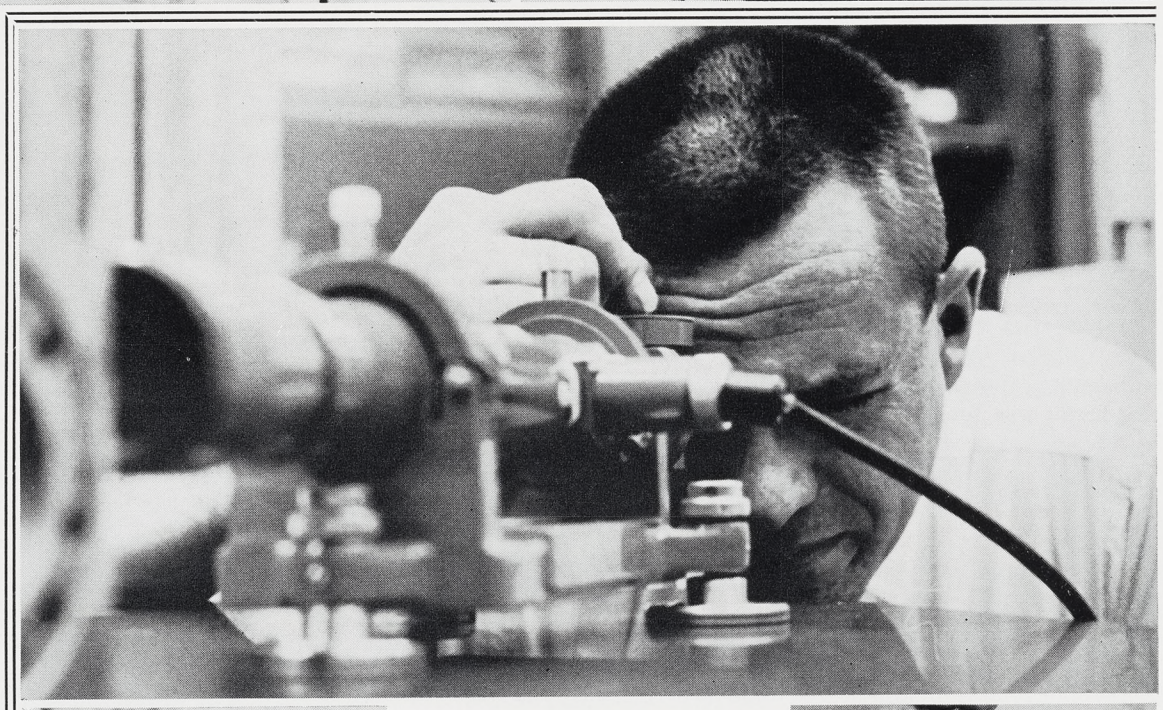


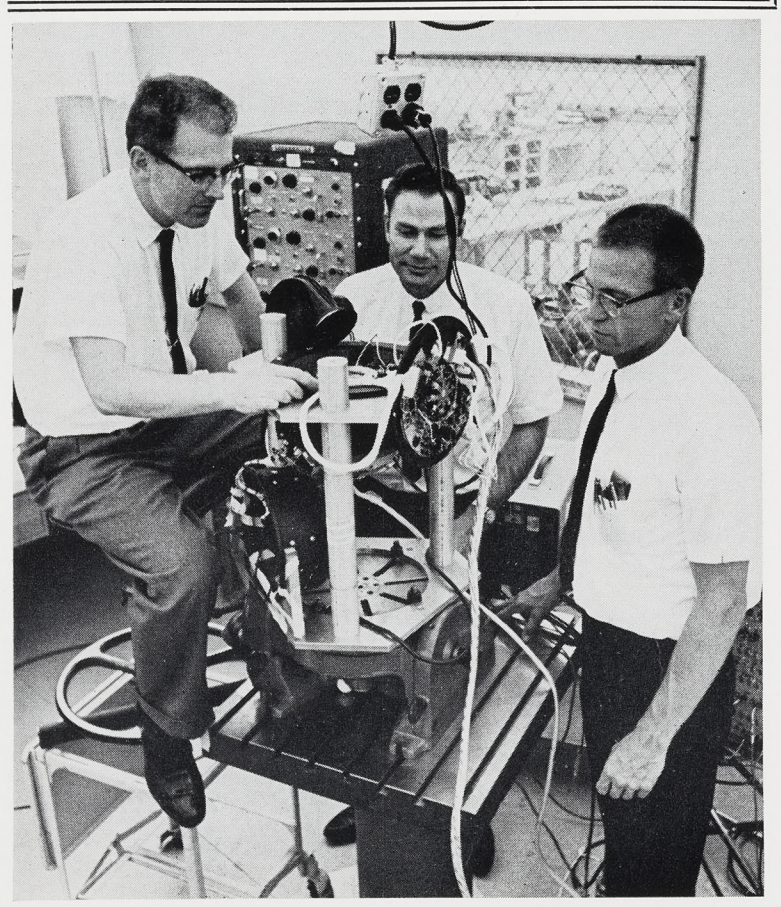


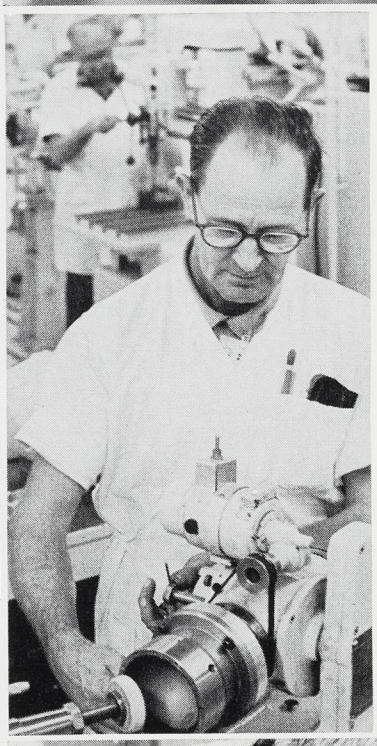


AROUND THE LOOP

On the heels of a sale of its NDC 1050A computer to the Air Force, Nortronics (Hawthorne) has announced the development of a multi-purpose digital machine, designated NDC 1051. With dozens of possible applications and small enough for a secretary to hold in her hands, the NDC 1051 is in the tradition of the Computer Group, which has produced pioneering military computers in support of Northrop products since the Snark program in the early 1950's. Production scenes (top of page) show part of operation which makes Group self-sufficient. Computer Development Secretary Sheila Moore (left) holds GAM-87 prelaunch computer, an earlier development by the Group recently modified for an aerial photo mapping system. Putting their heads together (below) for a NDC 1051 discussion are (from left): Roy Gastor, assistant Group director; Wally Pfeil, chief of Advanced Computer Systems; Roy Kaufold, Group director; and Eddie Klein, chief of Computer Development.

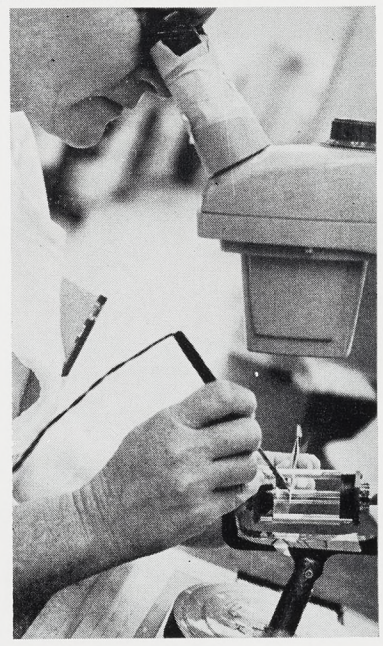


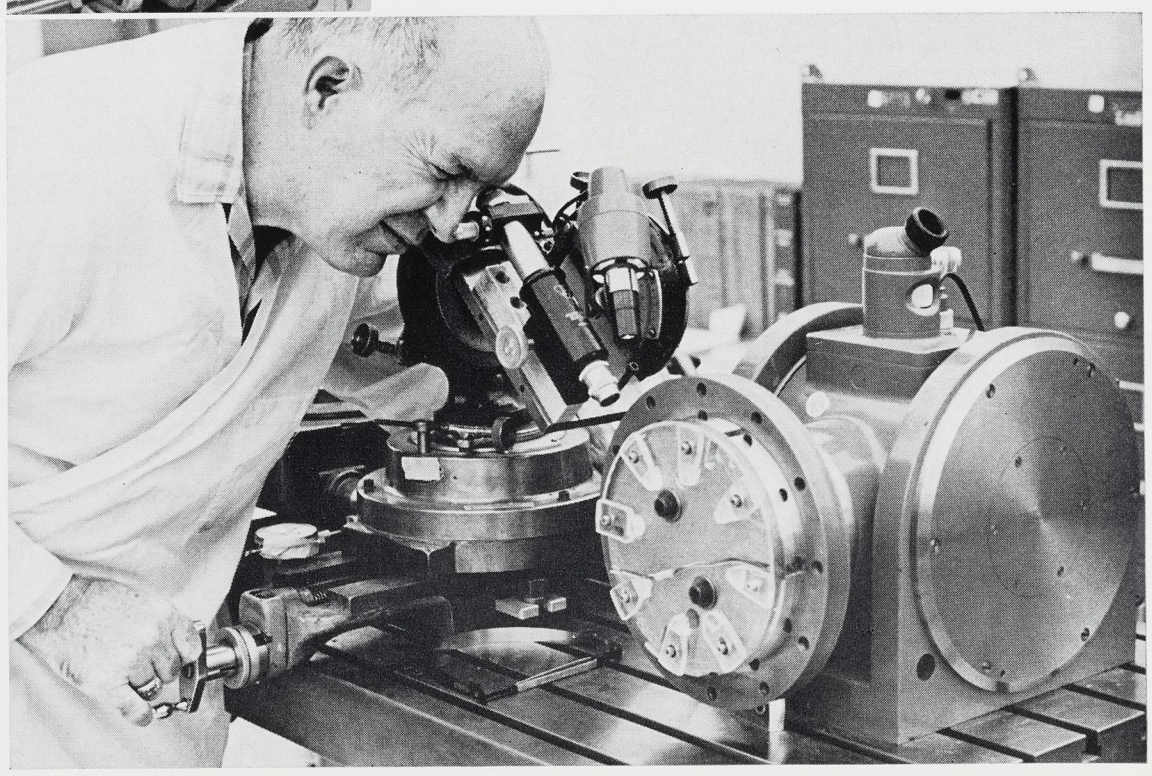




CALLING MR. B.

Engineering Development Support Group of Nortronics (Palos Verdes) is unique manufacturing operation which transposes advanced concepts, plans and designs into working hardware on a one-of-a-kind basis. Headed by M. E. Butler, known around Nortronics as Mr. B., the flexible group has the capability of setting up shop at any location as needed. In addition to its Palos Verdes operation, the Group supports the Computer Group at Hawthorne and frequently works at military test sites. The "eyes seem to have it" with R. E. Paramour (above), Anita Patry (right) and Claude Mallott (below left) as they use magnifying glasses for exacting work. In an engineering system performance test (below), F. H. McWaid, E. L. Horgan and R. N. Koerner (left to right) simulate operation of navigation equipment. Machine shop technicians, which include Bill Jackson (left), mold intricate parts for avante garde, one-of-a-kind products which may later become mass production items.





ARATA INSTALLED AS CHAIRMAN OF LOCAL AIAA

W. H. (Win) Arata, jr., this month is getting down to the business of heading the largest section of the American Institute of Aeronautics and Astronautics, following his installation June 24 as chairman of the 6500-member Los Angeles group.

A member of the Corporate Marketing staff, Mr. Arata was also honored at the dinner meeting as outgoing vice chairman-Meetings. He and Bill Oakes of Northrop Space Laboratories, the 1964-65 secretary, were presented plaques by outgoing chairman Maurice A. Sulkin.

Following the installation, members were treated to a discussion on the impact of automation on engineering and were introduced to revolutionary computer equipment from Massachusetts Institute of Technology and International Business Machines Corporation.

As 1965-66 chairman of the Los Angeles group, Mr. Arata will preside over activities involving more than 20 percent of the AIAA's national membership of 30,000.

More than 200 of Northrop's engineers and scientists are active members of the Los Angeles section, it was estimated by Mr. Arata.

Win Arata (left) receives plaque for year's service as AIAA vice chairman from M. A. Sulkin, outgoing chairman. Mr. Arata was then installed as chairman of the Los Angeles section for the coming year.

MODEL AERO CLUB SEEKING MEMBERS

A new group of model builders, the NRC Model Aero Club, has held initial organizational meetings and is seeking new members.

Next club meeting will be at 7 p.m. July 20 at the NRC Clubhouse, Anaheim.

ASTRONAUT TRAINERS—Northrop T-38, shown above in maiden flight with new paint job, is used by astronauts for flight training. Orange markings have been removed from trainers, which now are all white except for black section on nose to reduce glare for pilots.

Research Group Hosts AF Academy Grads, Cadets

Three recent graduates and six undergraduates of the U.S. Air Force Academy — participating in a summer research program at Northrop Nortronics' new Applied Research department in Newbury Park—are learning how industry conducts research.

While the move from Northrop Ventura facility is still in progress for the research group, its work is continuing. Transfer of the approximately 60 scientists, technicians and administrative men and women from Ventura to Nortronics was announced in early May.

The young lieutenants and cadets are getting their first glimpse of industrial research at the invitation of Dr. Donald A. Hicks, head of the research group.

Dr. Hicks, now a Nortronics vice president, made the open invitation during an address before the Air Force Academy Math Club in Boulder, Colorado, last year.

Most of the visitors gave up a good portion of their vacation to work beside Northrop scientists, according to Lieutenant Pat McDaniel, officer-in-charge of the group.

Lieutenant McDaniel will be seeing a lot more of Southern California. He intends to enroll at California Institute of Technology to work toward a master's degree in nuclear engineering.

Another graduate in the visiting group will also be staying in the Southland. Lieutenant Bill Hobbes has been assigned to Edwards Air Force Base.

Most of the visitors have a prior interest in the effects of electromagnetic radiation, a principle line of investigation by the Nortronics department.

Part of the group became familiar with Northrop aircraft during a visit of the Math Club last year to Edwards Air Force Base.

While Northrop is the only corporation cooperating in such a program, other cadets and graduates are working this summer at NASA's Manned Spaceflight Center at Houston, and at Wright-Patterson Air Force Base in Dayton, Ohio, a major Air Force research center.

BUT PLENTY OF 'EARTHLIGHT'

There's No Moonlight for Lunar Explorers

That symbol of romance and rapture — moonlight — will undoubtedly be on the minds of future astronauts exploring the lunar surface — but for an unromantic reason.

Because the moon has no atmosphere, the intensity of light during periods of direct sunshine causes completely dark shadows, which may hide dangerous craters. Glare inside the lunar vehicle would also affect astronauts' ability to see and would cause physical discomfort.

These and other special problems of illumination for man and his equipment on the moon were outlined June 22 at Houston by Trevor Robinson, formerly of Northrop Space Laboratories, now with the Condor program at Norair, at the 1965 Aerospace Technical Conference and Exhibit of the Institute of Electrical and Electronic Engineers.

At night, natural illumination on the moon comes from "earthshine," which is sunlight reflected by the earth. Earthlight on the moon, however, is more than 60 times more intense than moonlight on earth, Mr. Robinson pointed out.

"During minimum earthshine, a man with good vision would just barely be able to see colors and distinguish normal print," he said.

In addition to the need for some means of projecting light into shadow areas, Mr. Robinson said that windows, shades, screens and interior cabin finish of the lunar vehicle must be coordinated with visual tasks required.

The technical paper covered research performed in conjunction with NSL's full-scale mockup of its lunar surface vehicle and a one-sixth scale model of the moon's surface, made with the aid of Ranger photographs.

Lunar lighting conditions were simulated on the lunar surface replica.

Scientist-Astronauts To Get T-38 Training

Four of the six scientists-astronauts recently selected by NASA for the Manned Space program will begin a year of flight training this month at Williams Air Force Base, Arizona, which will include 120 hours instruction in the Northrop T-38.

The men were selected from a field of more than 1700 applicants who were screened by the National Academy of Science as well as NASA.

At a Houston news conference June 29, the future moon explorers described their upcoming role in the space program as filling the gaps left by instruments.

The four non-pilots—Dr. Owen K. Garriot, associate professor of physics at Stanford University; Dr. Edward G. Gibson, Newport Beach physicist; Duane E. Graveline, NASA flight surgeon; and Harrison H. Schmitt, an astrogeologist—have been ordered to report to Williams June 28, where they will join 60 other student pilots for a 53-week course.

Their training will include 300 class hours and 240 flying hours, NASA said.

The other two successful applicants, Dr. Frank C. Michel, a Rice University professor, and Dr. Joseph P. Kerwin, a Naval flight surgeon, are qualified pilots.

While NASA and the astronauts indicated specific experiform were undecided, they pointed out that the unknown factors of space will require more and more human involvement.

Astronauts in the Mercury and Gemini projects have also used the T-38 in their training program.

NRC BOOKS THEATRE FOR 'SOUND OF MUSIC'

Northrop Recreation Clubs have joined forces to "buy the house" for a special all-Northrop night to see the Rodgers and Hammerstein motion picture of "Sound of Music."

The date is August 8. The time, 7 p.m. The place, Fox Wilshire Theatre in Beverly Hills.

Because NRC has reserved the entire theatre just for Northrop folk, tickets are being offered at a reduction over normal rates. Each ticket sells for 50 cents below commercial rates. Employees have a choice of $2.50 or $3 seats which includes the reduction. All seats are reserved.

Tickets went on sale this week throughout Northrop West Coast facilities. They may be obtained from regular ticket outlets.

UCLA Names Getz Guest Lecturer

Clyde Getz, chief engineer, Special Projects section of Northrop Nortronics (Hawthorne) will be a guest lecturer in a two-week UCLA short course beginning October 4 on automatic checkout techniques for aerospace vehicles.

The university extension program, which will cover the philosophy as well as hardware requirements of automated checkout equipment, will run from 8:30 a.m. to 4:30 p.m. Monday through Friday.

Stamp Club Hosts

Northrop Stamp Club will hold a joint meeting with the Hollywood Stamp Club at 7:15 p.m. July 19 at the NRC Clubhouse, Hawthorne.

TOM McSWEENY EARNS NSF GRANT —THE HARD WAY

If Tom McSweeny appears to be walking on air lately, his fellow Northrop Norair employees are forgiving. Most feel he's earned the right many times over.

Mr. McSweeny

Thomas E. McSweeny has graduated Cum Laude with a degree in aeronautical and astronautical engineering; accepted a coveted graduate scholarship at Cal Tech; and prepared to hold down an engineering job with Norair this summer.

There is more to the story, of course.

Mr. McSweeny and his wife came to California from Minnesota in early 1962 so he could attend Northrop Institute of Technology. This month he graduated after posting a 3.667 grade point average, putting him at the top of his class.

Since May 1962, Mc McSweeny has worked full time in Norair's Mail services on the night shift. He has received assistance from Northrop's Education Refund program, since he met certain special criteria.

Word that he had been awarded a National Science Foundation Graduate Traineeship at Cal Tech came recently, a distinct honor for any student. He will receive full scholarship coverage while obtaining his master's degree.

"I would like to return to Northrop after completing my graduate studies," Mr. McSweeny said. "Then, in time, I would like to study for a doctorate."

Those familiar with his struggle to date have little doubt that Mr. McSweeny will follow through with honors.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:30 a.m. — 4:15 p.m.

Marine & Highland, Manhattan Beach. Louise Berg, ext. 2763. 3

8 a.m. — 4:45 p.m.

Springdale & Edinger, Huntington Beach. Robert Forshner, ext. 1120, 893-7976. 5

Rides Offered

7 a.m. — 3:45 p.m.

Avalon Blvd. & 190, Gardena. Genaro Chapa, ext. 2568, DA 3-9447. 12

8 a.m. — 4:45 p.m.

Springdale & Edinger, Huntington Beach. Robert Forshner, ext. 1120, 893-7976. 15

Small enough to become habit-forming; large enough to add up quickly, the $25 "Series E" U.S. Savings Bond—purchase price, $18.75—is a big beginner for the steady saver.

'Work Experience' Roll Grows to 20 Students

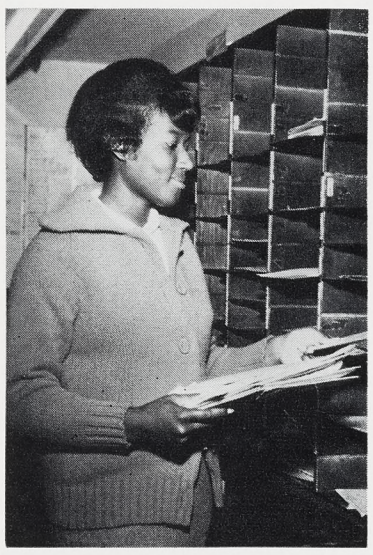
Northrop Norair has once again increased its support of a unique program affording select high school students a rare opportunity to observe modern industry in operation.

Norair began its association with the program, called a Work Experience Program, last February by accepting four students. In April this number was doubled, and last week grew to 20 student participants.

Northrop is the first major Los Angeles area firm to take part in the program.

Los Angeles City School System instituted the program as a means of encouraging participants to take courses that will better equip them to secure jobs in industry following graduation. Toward this end, only students in their junior year are allowed to take part.

Each student spends half of a school semester in on-the-job training, then completes the semester by attending related classroom studies. Each is graded and receives full credit for program participation.



Ruth Robbins (above) has landed summer job at Norair after taking part in Work Experience Program for high school students.

Students reporting to Norair work from 8 to 10:30 a.m. in such functions as Mail Services, Tooling, Fabrication, Communications, Personnel, Fabrication Dispatch, and the Technical Library. Normally, they spend two weeks in a function, then shift to another.

Participants are normally divided between girls and boys. Initially, all hailed from Manual Arts High School. Currently, the group includes Manual Arts and Dorsey students and in the fall students from Leuzinger and South High Schools will join the Norair part of the program.

"Northrop recognizes this program as an opportunity to fill a worthy community need and, more important, lend a helping hand to our future citizens," said Paul Crews, director of Industrial Relations.

C. Z. Stine, supervisor of Industrial Training and Norair administrator for the program, indicates students quickly form important conclusions, based on their work experience, as to courses they need to enhance their chances for good jobs later.

Program advisors at Norair have included Jo Roth, Robert Keating, Louise Hobson, Ben Chinn, John Fink and Dona Page. Nate Jackson represents the Los Angeles City School System.

Those who have supervised the students have found them extremely interested and willing. Mr. Keating noted most "are eager for knowledge and appreciative." Miss Page found them attentive in Personnel assignments and "well versed in the value of their studies." Shirley Markley of Communications reports the students "cooperative and interested," and Mr. Chinn adds that most adults "learn something in their association with the youngsters."

Ruth Robbins of Manual Arts was among the first students taking part in the Norair training. On the strength of her ability and willingness to work, she has landed a job as a Norair summer hire in Mail Services.

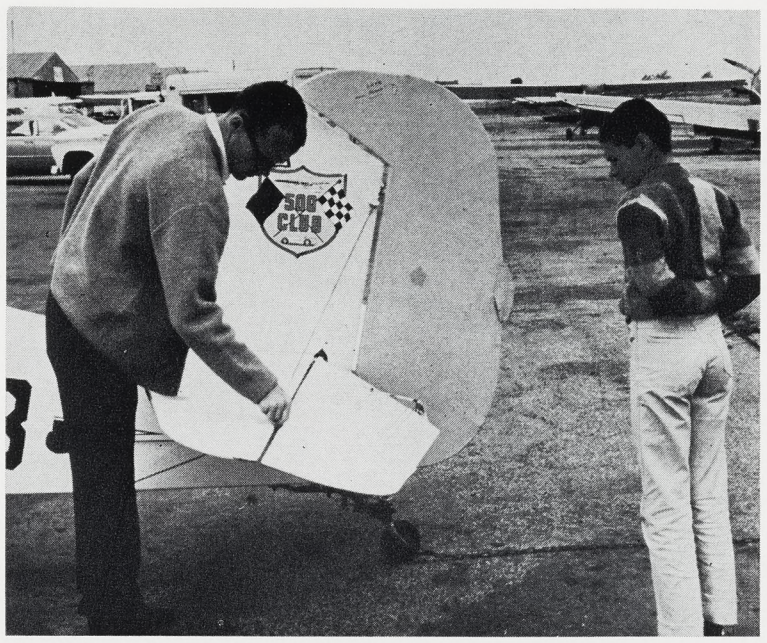
"All of the students at our school know of the program and many would like to take part," Miss Robbins said. "This is my first real job and important to me. I know now the type of studies I must follow to get a good job."

Handful of Openings Left on Europe Tour

A gathering of Europe-bound travelers who will take part in an NRC-sponsored excursion in October has been set for 7:30 p.m. July 27 at the NRC Clubhouse, Hawthorne.

Movies of the last European trip will be shown and special information will be supplied those already signed up or interested.

Only about six places remain open on the tour. Information is available through Personnel Activities offices at all Northrop installations.



Don Hicks (right), son of Richard W. Hicks, of Norair, prepares to make one-hour flight with NRC Flying Club member Don Murray. Flight is door prize offered monthly by club, which meets the third Thursday of every month at NRC clubhouse. Club is also beginning monthly classes in flying for youngsters.

Changes Being Accepted In Salaried Savings Plan

Participants in the Northrop Salaried Employees' Savings Plan were reminded this week by Industrial Relations that the time is at hand when changes in personal contributions to the Plan may be made.

Such changes will be based on the participant's salary in effect May 1, 1965, and must remain within the allowable two percent minimum and five percent maximum range.

Requests for changes will become effective August 1, 1965.

Change cards must be completed by the individual and filed with Industrial Relations on or before July 23, 1965.

Change cards are available at Northrop Norair in the Personnel office or the Compensation Administration branch office, Engineering Science Center. At the Corporate office cards are available through Industrial Relations.

At Northrop Ventura cards are available at the Employee Relations and Compensation group office. Nortronics cards are available at Employee Services functions at Hawthorne and Anaheim; at the Palos Verdes Personnel office; and Cape Kennedy Administration office.

TWO AF OFFICERS FINISH TRAINING WITH NORTHROP

Two Air Force captains, Thomas C. Becker, jr. and Ora L. Simpson, jr., have departed following a 10-month tour of duty at Northrop under auspices of the Air Force Institute of Technology Education With Industry program.

Captain Becker is reporting to the Los Angeles Contract Management District at Inglewood, while Captain Simpson shifts to the C-141 System Program Office at Wright-Patterson AFB, Ohio.

Both officers reported to Northrop last September for a program which saw them concentrate on the management aspects of industrial planning and procurement. Each spent time working closely with Northrop personnel at the Corporate office, Norair, Northrop Space Laboratories, Nortronics and Ventura.

F. W. Lloyd, Norair vice president and assistant general manager-Operations, presented each officer with a Northrop certificate of completion prior to their departure.

Harry Blocher, supervisor of Training Equipment, was administrator of their training program at Northrop.

INDOOR EVENT SET FOR NRC MODELERS

"Pilots" of indoor rubber-powered models are being invited to take part in a Norair Modelers meet set for 7 to 10 p.m. July 16 at the Lawndale High School boy's gymnasium, according to N R C Commissioner Earle L'Homme.

All types of indoor models will be flown with no organized competition, although ribbons may be distributed by Jim Richardson.

LETTERS

Editor,
THE NORTHROP NEWS

With great interest I read the ZD Special Edition which came out June 21 in advance of our big rally.

As I scrutinized the credits given to people responsible for the preparation of the Inaugural Day, it became obvious that Graphic Services, under the direction of Mr. John R. Bellevue, was not to be recognized.

We, of Graphic Services Production, were particularly disappointed, because for the past six months we have created the typing, varityping, and art work for this important program, under the guidance of Mr. Max C. Windmiller, our supervisor.

Graphics Administration, Photo Lab, Motion Pictures, Lithographic Services and Reproduction, under the supervision of Dick Lake, Harold Pershing, Larry Grabert, Bill Wyper, and Bill Posey, respectively, were responsible for producing the finished products.

Mr. Editor, sir, I suggest that for some unfathomable reason, we were overlooked.

Ruth F. McCluskey
Typist Compositor Lead
Organization 1159

(Editor's Note: Ruth, we are crushed. You have found a defect in what we meant to be a perfect edition. Even so, thank you for calling this oversight to our attention).

Final Call for Frisco Sounded by NRC

Final call for Northrop employees interested in an all-inclusive package trip to San Francisco July 30-August 1 was sounded this week.

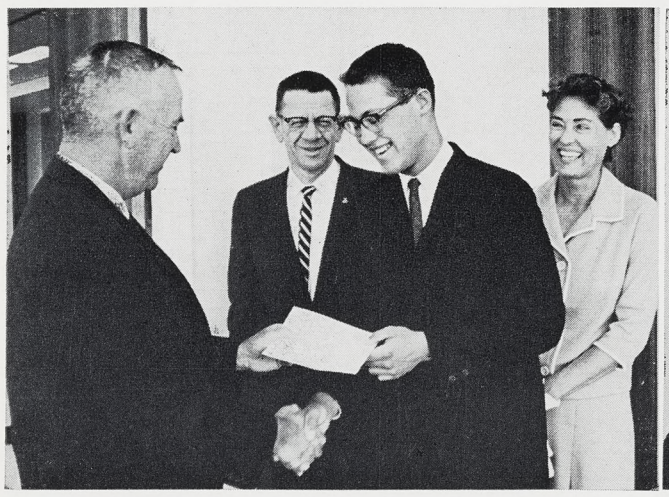
The total cost is $53.85 per person and includes round trip jet transportation, two nights' lodging at the Fielding House, a choice of two tours (family-type tour or night club tour), and gourmet dining (17 restaurants to select from) at two for the price of one.

Reservations are now being accepted at Norair and Nortronics (Hawthorne) Personnel Activities offices. Full payment is due tomorrow, July 15.

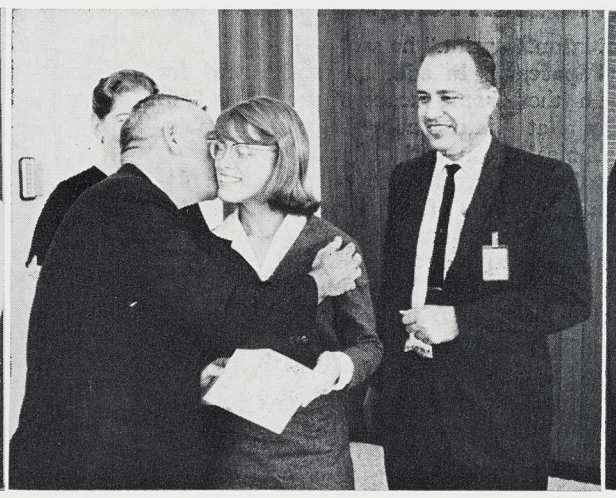
Need a $5000 nest egg? Buy a $100 "Series E" Savings Bond, once a month, where you work or bank (purchase price, $75). In five years, you'll have $4856 in cash value.

ONE . . . TWO . . . THREE . . .

. . . NORTHROP MERIT SCHOLARSHIPS ACCEPTED BY DIVISION EMPLOYEE'S CHILDREN . . .



Vice President and General Manager George Douglas presents certificate to Robert William Dedon in presence of scholar's parents at Northrop Ventura.



Mr. Douglas had privilege of making presentation to the only young lady among the eight winners, Alice Cordell, with Mr. and Mrs. Edward L. Cordell attending.

At Hawthorne, Mr. and Mrs. Bert Cook (left) and Quality Control Manager Bob Catlin flank one of Norair scholars, Doug Cook, at ceremony. Doug's father works in Quality Control.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Cedar Chest, $5. L.A., 754-4384. A

Belt Massager, Formette, $20. Inglewood, 675-0521. A

Bicycle, boy's, 26″ 3-spd., gears shift on hand grip, new gears, drop bars, $20. L.A., 292-4958. A

Stove, reconditioned, used only 2 mos., $38.50. Inglewood, 672-8830. A

Movie Camera, 8mm Revere turret, Wollensak lenses, type A filters & leather carrying case, $40. Hawthorne, 675-8413. A

Dinette Set, table w/center leaf & chairs, $15. L.A., 291-7715. A

Surfboard, 9′6″ Dewain, blue metal flake, ding proof, $60. Redondo Bch., FR 4-2915. A

Cemetery Plot, 2, Inglewood, Greenlawn section, $700. Hawthorne, OS 6-8842. A

Home, 5-bdrm., 1¾ bath, redec., lge. fenced yd., walking distance to stores, schools, $22,500. W. Fullerton, 595-3429. A

Home, 3-bdrm., family rm., 2 bath, fireplace, unobstructed view, fenced, landscaped yard, 1-yr.-new, $34,700. Palos Verdes Pen., 377-5172. A

House, 3-bdrm., fireplace, link fenced, fruit trees, patio, garden, ½ acre, 90 rose bushes, $35,000. Thousand Oaks, 805-495-3449. A

Chevrolet, 1948, 6-cyl. flathead eng., need vac. unit on stick shift, $50. Hawthorne, 675-6291. A

Organ, Baldwin model 40 Orga-Sonic, w/ percussion, Philippine mahogany w/matching bench, $695. Redondo Bch., FR 5-3914. A

Lot in Inglewood Cemetery, 2 adjoining, incl. perpetual care, $1000. Huntington Bch., 714-897-7166. A

MG-TF, 1500 cc, good eng., new top, brakes & clutch, wire wheels, 70,000 act. miles. $675. Manhattan Bch., FR 2-0540. A

Dishwasher, Lady Kenmore, coppertone, w/ formica top, 3-cycle, lge. capacity, $140. Torrance, 835-3985. A

Mini-Bike, 6-mos-old, $110. Long Bch., 424-5992. A

Stove, elec., $30. Inglewood, 672-5798. A

Bed, Babyline, white, adjustable sides, spring, $15. Gardena, 329-9484. A

MG, 1961 convert., 1600 series, $1395. Torrance, 378-3788. A

Accordion, 120-bass, $125. Gardena, DA 4-0158. A

Camera, 35mm Argus C4, f2.8 lens w/case & b.c. flash, $30. L.A., 670-2564. A

Range, O'Keefe & Merritt, double oven, grill, $65. Gardena, 675-1005. A

Refrigerator, Coldspot, $20. Hawthorne, 679-4359. A

Pool, 18′, Doughboy, minus liner, filter, ladder & skimmer, $75. Hawthorne, OS 6-3886. A

Step End Table Set, w/drawer, Kroehler burnished mahogany, $35. El Segundo, EA 2-0678.

Window Set, 4 3′ x 4′ louvre-framed, 3 w/ screens, $44. Manhattan Bch., 376-4787. A

Projector, Kodak Cavalcade 35mm, auto. w/ 500 watt bulb, $75. Torrance, 371-9730. A

T-Bird, 1955, porthole top, 1957 Pontiac eng. & trans., $1350. Anaheim, 714-JE 4-8982. A

Bicycle, boy's 20″, $15. Inglewood, PL 5-4497. A

Bathing Suit, gold lame, size 10, De Weese, never worn, $10. Hawthorne, 671-3154. A

For Sale

T-Bird, 1962, pink, black int., p/w & seat, 30,000 mi., new tires, $2000. Redondo Bch., FR 5-3257. A

Chevrolet, 1960, pickup, lge. bed, hvy. duty, $950. Hawthorne, OS 5-2403. A

Roto Tiller, 4 hp Briggs & Stratton, enc. housing, forward & reverse, $90. Gardena, 370-6472. A

Ford station wagon, 1956, V-8 eng., stick shift, o/drive, new clutch, valve & ring, $150. Hawthorne, 679-5398. A

Aquarium, 10-gal., w/stand, lights, heater & misc. equipment, $25. Torrance, FA 0-1897.

Volvo 544, 1963, low mileage, all extras, new tires, $1500. Redondo, 378-0158. A

Muffler, Abarth, for late model VW, $25. Torrance, 371-8939. A

Bedspread, Heirloom, full size, white, reversible, $5. Torrance, DA 9-3721. A

Washer-Dryer Combination, gas, needs repair work, $50. Inglewood, PL 5-5149. A

Carpet, 40 yds. solid all wool frieze, plus 4 bound scatter rugs to match, $150. Gardena, 327-4791. A

Mustang, 1965, take over $88 mo. pymts, $2800 bal., Gardena, 676-5505. A

Plymouth station wagon, 1957, $225. Inglewood, 673-1097. A

Record Player, stereo, blonde, Decca, $100. L.A., PL 6-3025. A

Cabin Sites, 5-acre, near Willow Springs, Calif., $1750. Rolling Hills, 325-3057. A

Living Room Set, 5 upholstered pcs., 3 cherry tables & 21″ TV, $250. Palos Verdes Pen., 377-6149. A

Pool, plastic, 18′ x 4′, ladder, filter, center drain, new frame & cover, $200. Huntington Bch., 714-842-1733. A

Beagle, 15-mos.-old, female, AKC reg., $70. Palos Verdes Pen., 377-5724. A

Surfboard, Jacobs 9′, 3 stringers, pigment, reinforced nose & tailblock, 6-mos.-old, $70. Torrance, 371-8638. A

Chevrolet, 1956 sedan, Powerglide, good tires, $350. Long Bch., GA 3-1363. A

Austin Healey Sprite, 1962, red, $1100. Palos Verdes Est., FR 5-5139. A

Boat, 16′ ½″ Wizard fibreglass, near new Johnson 75 hp motor, complete w/trailer, $1500. Gardena, DA 3-6366. A

Crib, w/mattress, white, convert to youth bed, $15. Hawthorne, 675-5654. A

Lawnmower, Sears, power, used 6 times, $65. L.A., 478-7551. A

Organ, antique parlor-type, oak, refurbished bellows, simple design, $100. L.A., 274-4865.

Chevrolet, 1957, $950. Torrance, 370-4747.

Racing Wheels, 4 12″ mag., Halibrand, never used, $80. Redondo Bch., FR 8-8815. A

Pool, Doughboy, 12′ dia., 3′ deep, comp. w/ filter, skimmer, vacuum & ladder, $50. L.A., EX 7-0366. A

Tires & Tubes, low mil., 3 5-ply, 6.70x15 nylon, $20. Torrance, 835-9486. A

Chevrolet, Impala S.S., 1963, factory air, 327 eng., r/h, p/s, p/b, $1875. Granada Hills, 363-2113. A

Bedroom Set, light wood, bed, dresser, mirror, night stand, $65. Gardena, DA 9-9195.

Chevrolet, Impala sport cpe., 1958, 348 cu. in., eng., p/s, r/h, new w/s/w, many extras, $725. Hawthorne, OS 6-4915. A

Dresser, w/detach. framed mirror, maple, 9 drwrs., $40. L.A., GR 3-3168. A

MG midget, 1964, British racing green, extras, radio, $1800. El Segundo, 322-6550. A

Chevrolet, Bel Air, 1957, 2-dr. h/top, r/h, new trans., 50,000 orig. miles, $550. Hawthorne, 371-0194. A

Volkswagen Camper, 1958 body, 1964 chalet camper int. w/tent, stove, 12-gal. water tank, & other access., $1200. Hawthorne, 675-4505. A

Triumph 4, 1963, 22,000 miles, new tires, wire wheels, $1700. Inglewood, OS 6-1475.

Bicycle, boy's 28″, $5. Hawthorne, OS 9-8644. A

MG, 1957 h/top, $700. Inglewood, OS 6-0049. A

Lot, single, Inglewood Parkview cemetery, $550 plus transfer fee. Torrance, TE 5-2128.

For Sale

Swim Pool w/ cover, trophy, 4′x15′, used 3 mos., $50. Manhattan Bch., FR 4-8036. A

Dodge Dart, 4-dr. sedan, 1964, 145 hp, auto., r/h, 24,000 miles, $1750. Anaheim, 735-1232.

Camper, cabover, self-contained, many extras, built on 1959 Ford, $2900. Redondo Bch., 374-1589. A

Windows, 3 double-hung, w/balancers, 36″x 42″ & 1 standard door, $9. Hawthorne, OS 6-1018. A

Studio Couch, $20. Inglewood. OR 8-1692. A

Tires, 2 4-ply 6.50x13 nylon tubeless, never used, $24. Torrance, FR 4-4953. A

TV, 21″ table model, $30. Torrance, FA 8-3306. A

House, 2000 sq. ft., 3-bdrm., 3-bath, family rm., corner lot, $41,750. San Pedro, TE 1-2973. A

Air Conditioner, 1964 Chrysler Airtemp, 18,000 BTU, 220 volt, $225. Hawthorne, 675-2395. A

Boat, 25′, bridge dual controls, lge. bait tank, $1500. Hawthorne, OS 5-7729. A

Washer-dryer, 1961 Westinghouse, operates on 220 volts, $32.50. Buena Pk., TA 8-2857.

Shaver, Schick 10-66, 3-spd., adjustable heads, $8. Torrance, 371-9651. A

Range, gas, O'Keefe & Merritt 4-burner, griddle & oven, $45. Torrance, FR 1-2381. A

Stereo Hi-Fi Components, AM/FM tuner, dual amplifier & preamps, 4 speakers, stereo turntable, $65. Hawthorne, 676-0418. A

Bedroom Set, walnut, dble. bed, mattress & box springs, vanity, night stand, $60. Hawthorne, 675-2514. A

Pontiac, 1957, 2-dr. sp. coupe, chrome rims, new brakes & battery, $350. Torrance, 325-2292. A

Mercury, 1956, new trans., $200. Hawthorne, OS 6-0264. A

Cartop Carrier, adjustable, custom-made, $40. Gardena, DA 9-5564. A

Go-Cart Chassis, factory-built, seat pad & back, gas & brake linkage, steering, eng. mounts installed, eng. available if desired, $30. L.A., 476-1635. A

Volkswagen, 1964 low mileage, heater, seat belts, $1550. Gardena, 436-3900. A

Lounge, Mak-a-bed & super mattress, $150. Hawthorne, 676-8282. A

Home, 3-bdrm., spacious & modern, close to city, lge. living room, den, 2 baths, beach rights in La Costa Beach Club, may take second, $54,900 or lease. Malibu, 456-2625.

T-Bird, 1960 auto., r/h, chrome mag. wheels, new tires, $1300. Long Bch., HA 5-9532. A

Sailboat, 19′ Lightning class, 2 sets of sails, trailer, extras, $800. L.A., OR 0-3713. A

Radio, comb. stereo & AM/FM, 1-yr.-old, $250. Reseda, 343-6948. A

T-Bird, 1959, full power, $895. San Pedro, 547-3490. A

Cadillac, 1961, convert., full power, $1900. Redondo Bch., FR 5-2747. A

TV, Zenith portable, 19″, 2-yrs-old, $70. Hollydale, ME 3-2395. A

Ford Fairlane, 1958, auto. trans., p/s, new w/w tires, new radiator, points, plugs & voltage reg., $350. Manhattan Bch., FR 2-1945. A

Plymouth, 1956 6-cyl., p/s, auto. trans., 4-dr. sedan, $150. L.A., 620-2762. A

Bassinet w/mattress, white, $4. Hermosa Bch., 376-5131. A

Desk & chair, blonde, $40. 632-2003. A

Pups, miniature pinschers, AKC reg., females, 3-mos-old, $75. L.A., 294-6390. A

Boat, 14′ Mark 20 motor & trailer, full canvass cover, spare tires & tubes, life preserver, $200. San Pedro, TE 1-3483. A

Plymouth, 1959, 4-dr. Savoy, auto., $275. Inglewood, 329-0764. A

Cabin Cruiser, 22′, 70-hp Gray marine eng. in-board, fiberglassed, $2000. L.A., 776-4199.

House, 3-bdrm., redec. kitchen, dining room, 50′x120′ lot w/blockwall, $23,950. L.A., 645-6999. A

Volkswagen, 1961, 30,000 miles, sunroof, w/s/w, heater, $1200. Tarzana, 343-7880. A

Piano, Story & Clark spinet, circ. walnut case, $350. Hawthorne, OS 6-5253. A

For Sale

Cemetery Lot, Inglewood Park Rest Haven dble. inter. privilege, perpetual care, $1100. Torrance, DA 6-1471. A

Vehicle, 3-wheel golf cart-type, 4-cycle, B&S eng., 2½ hp, $95. Rolling Hills, FR 5-8536. A

Washer-Dryer comb., Kenmore, $125. Lawndale, 320-2715. A

Dining Room Table, teakwood contemporary, $25. Torrance, 6-5004. A

Storage Cabinet, 1964 5′ bronze metal w/top shelf, $25. Inglewood, 672-6345. A

Volkswagen, 1961, $1200. Eastview, TE 2-5796. A

Stove, Occidental, $20. Hawthorne, OS 9-3540.

Sailboat, sabot, 8′ centerboard w/sails, $120. Torrance, FR 1-5072. A

Monza, 1964 2-dr., 4-spd., r/h, all extras, 1 owner, $1550. Palos Verdes Ests., FR 7-1478. A

Drafting Machine, Bruning, model 2700, used 1 yr., $85. Torrance, 327-8226. A

Chevrolet Impala, 1959, new auto. trans., p/b, p/s, $995. Hawthorne, 676-3132. A

Organ, Lowrey, full scale mahogany, Leslie speaker, $750. Hawthorne, OS 9-5035. A

Posture Chair, moving center sec. & 2 removable end couch, $25. Inglewood, PL 5-4762. A

Cabin Cruiser, 18′ long, 8′ beam, fiberglass & wood, 30 hp Evinrude elect., trailer, access., $500. L.A., PL 4-5288. A

House, 3-bdrm., modern, 2-bath, sundeck, fenced yd., built-in kitchen, $33,000. Manhattan Bch., 379-6442. A

Honda Scrambler, 1963, custom paint & chrome, $650. Portuguese Bend, FR 7-2921.

Honda 50, 1963, helmet, $175. Hawthorne, 675-9227. A

Train, Lionel, many extras, O scale, $75. Inglewood, OS 6-8893. A

Chevrolet, 1956, r/h, 8000 mi. on eng., $395. El Segundo, EA 2-2924. A

Divan, 96″ wide, brown, $40. Rolling Hills, FR 5-6114. A

Plymouth, 1955 sedan, 6-cyl., o/drive, stick shift, 65,000 orig. miles, $175. L.A., PL 4-0078. A

Plymouth Savoy, 1962, V-8 auto., 4-dr., $600. Redondo Bch., FR 5-5760. A

Wanted to Buy

File Cabinet, metal, 4-drwr., letter or legal size in good condition. Los Alamitos, GE 1-4233. B

Camera, 4″x5″ or larger view. Reasonable. San Pedro, TE 1-4526. B

Weightlifting Set, junior size. Harbor City. 326-8033. B

FREE (To Be Given Away)

Dog, toy & manchester. male, 3-yr-old, housebroken, had all shots. Hawthorne. 675-3948. D

Kittens, 9-wks-old, various colors. Torrance. FR 1-2394. D

Records, assorted 45. Manhattan Bch., 372-0816. D

Kittens, 8-wks-old. Rolling Hills, FR 7-3487.

Pups, 2 3-mos-old, half cocker & half poodle, males. Hawthorne, 676-0017. D

Pup, English, purebred, 7-mos-old, to good home w/lge. yard. Canoga Pk., 348-4874. D

Rentals Offered

Cabin, Lake Gregory & Crestline, sleep 6, for vacations, weekly, June to Sept., $60 wk., Venice, EX 1-2040. E

Apt., 2-bdrm., garbage disp., laundry rm., 3 miles from Northrop, $90 & $95. L.A., 755-9071. E

Apt., deluxe 2-bdrm, ½ block to Hawthorne Blvd., shopping & bus. $115 mo. Hawthorne, OS 9-1179, OS 6-1774. E

Apt., 2-bdrm, close to Northrop, gar., newly redecorated, fenced yd., $110 mo. Torrance, OS 9-4817. E

Cabin, Lake Arrowhead, sleeps 6, ½ mi. to lake & village, all utilities, $50 wk. No. Hollywood, 761-9645. E

Rentals Offered

Apt., Bass Lake near Yosemite, pvt. ent., deck, dock, & boat mooring, sleeps 4, $100 wk. for 2; $125 for 4. Rolling Hills, 377-2101. E

Apt., near So. Bay shopping center, laundry facilities, thermo heat, 2-bdrm. $115; 3-bdrm. $135. Redondo Bch., 375-6715, FR 6-8801. E

Cabin, A-frame, at Big Bear Lake, Moonridge area, sleeps 6 adults or 4 adults w/children, $30 weekend, $80. wk. Palos Verdes Est., FR 7-3888. E

Apt., 1-bdrm., deluxe, built-ins, pool, $90 mo. Redondo Bch., 376-2117. E

Cabin, near lake, fishing, swimming, boating, $55 wk. Torrance, 320-2002. E

Sleeping Rooms, linen furn., new, $12.50 week. Lawndale, 371-6775. E

Studio Apt., 2-bdrm., unfurn., 1½ bath, tile kitchen, 1 child o.k., near Norair, $115. Hawthorne, 679-0622. E

Bachelor Apt., furn. closed gar., laundry, $95 mo. Torrance, FR 5-0867. E

Apt., deluxe 2-bdrm., 2-bath, dishwasher, fireplace, near Norair, $135. Hawthorne, 679-1358. E

Apt., unfurn., 2-bdrm., $100 mo. Redondo Bch., 376-4978. E

Bachelor Apt., furn., incl. utilities, $50 mo. Hawthorne, OS 6-5921. E

Apt., 1 & 2-bdrm., furn. & unfurn., all elect., $85 & $125. Torrance, 375-9397. E

Apt., 1-bdrm., utilities paid, washer, dryer, pool, 1½ miles from Northrop, unfurn., $100; furn., $120. Hawthorne, OS 9-7123. E

Apt., 2-bdrm., unfurn., children OK, 9 miles from Norair, $90 mo. Lynwood, 635-3784. E

Apt., 1-bdrm., unfurn., garage, serv. porch, yard, $100 mo. L.A., 477-0618. E

Unit, owner's, 1800 sq. ft., 3-bdrm., 3-bath, family rm., fireplace, pvt. deck & 3-car sub. gar. w/storage, soft water sys., adults, $260 lease. Inglewood, 373-1143. E

Child Care Offered

Experienced pre-school teacher desires 3 or 4-yr.-old child to keep in licensed home days. Good educational program as well as play. Hot lunches & snacks. Inglewood, 754-0227. G

Child Care Wanted

Baby Sitting & light housework, part time, own transportation, Baldwin Hills area. Culver City, 838-4378. H

Personals

The deepest thanks from myself & my family are extended to all of the friends of my wife, Marie Tate during her long illness. FRANK E. TATE & FAMILY. L

Wish to thank my many friends for being so thoughtful & for the many cards, gifts, flowers & phone calls during my recent illness. VIOLA PETERS. L

Pilots wanted for flying club, low cost flying in well-maintained, well-equipped planes, 2 Cessna 172's, 2 Beech Bonanza, Meyers 200A, $200 initiation fee & $14 monthly dues. Torrance, 324-2992. L

Apt., to share w/girl, 20-25, 2-bdrms., furn., fireplace, ocean view. Box 1101. L

All Auburn University alumni interested in a get together this fall please contact Dorothy P. McHugh. Inglewood, 673-4369. L

For Sale or Trade

Pontiac Catalina, 1964 conv., auto. trans., p/s, p/b, r/h, b/s, $2750 or trade for older transportation car plus difference. Santa Monica, 393-7464. M

Ford Country Squire, 1964, 9-pass. sta. wagon, fact. a/c, p/s, p/b, r/h, Cruise-amatic 390 X-L, $2795 or trade for older wagon, Santa Susana, 805-526-3902. M

Apt. House, 5-unit, 1-yr-old, 2 blks. from Norair, $81,500 or trade for other property. Hawthorne, OS 6-7417. M

File Cabinet Comb., $25. or trade for record player, banjo or guitar. L.A., AX 4-0727. M

Oldsmobile Dynamic 88, 1960, 2-dr. h/t, p/s, p/b, r/h, auto. trans., orig. owner, $800 or trade for Volkswagen or Triumph in good condition. Sherman Oaks, 784-9776. M

Volkswagen, 1963 2-dr. sedan, r/h, $1375 or trade on van-type camper, Volkswagen or other. Torrance, 371-5229. M

FOUR . . . FIVE . . . SIX . . . SEVEN . . .

. . . AND AN EIGHTH TO ROBERT MCMAHON OF PAGE COMMUNICATIONS (NO PHOTO AVAILABLE).

Norair scholar, Paul Glassco (right), accepts certificate from Welko Gasich. Donald Glassco, father of the winner, is at left.

Northrop Nortronics Treasurer Don Lewis (right) hosted Lance Berteisen, who is flanked above by parents.

From way back east at Nortronics Precision Products Department comes this photo of Mr. and Mrs. David E. Humez and son Nicholas, one of three Nortronics winners.

Nortronics Vice President F. W. Lynch (right) made award at Anaheim to Gary Turnbull, with Mr. and Mrs. Bob Turnbull atttending.

Mock Apollo Craft Escapes 'Explosion'

An emergency motor rocket towed a mockup of the Apollo spacecraft to one mile above the White Sands Missile Range June 29 in a successful test of how astronauts would escape should the Saturn V malfunction on the launch pad.

A Northrop Ventura parachute landing system returned the unmanned dummy craft to the desert floor out of danger 105 seconds after the simulated abort.

Other abort tests—each from a different altitude—of the emergency escape system have been completed, with the final one scheduled early next year.

The Apollo escape system differs from Gemini in that the entire command module is pulled free of its booster rocket by a separate 155,000 pound thrust rocket.

Gemini astronauts would use pilot ejection seats in an emergency.

BIG TABLE TENNIS TOURNEY UPCOMING

Entries close Friday for an all-Northrop Table Tennis Tournament slated for the last two weekends of July. Entry blanks are now available through Personnel Activities offices or NRC representatives.

This event, to be staged in the Leuzinger High School women's gymnasium, Prairie Avenue and Rosecrans Boulevard, Hawthorne, is open to all Northrop people.

Saturday, July 24, singles events for both men and women will be held at 10 a.m. The following Saturday (July 31) at 10 a.m. men's doubles and mixed doubles events will be held.

Champions will be asked to join an all-Northrop traveling team to represent the company in outside competition.

For those who wish to practice, special arrangements have been made with sessions to be held at 7 p.m. July 23 and July 30 at the tournament site.

Specific questions may be referred to Tom White, ext. 2486, Norair.

NORTHROP NEWS

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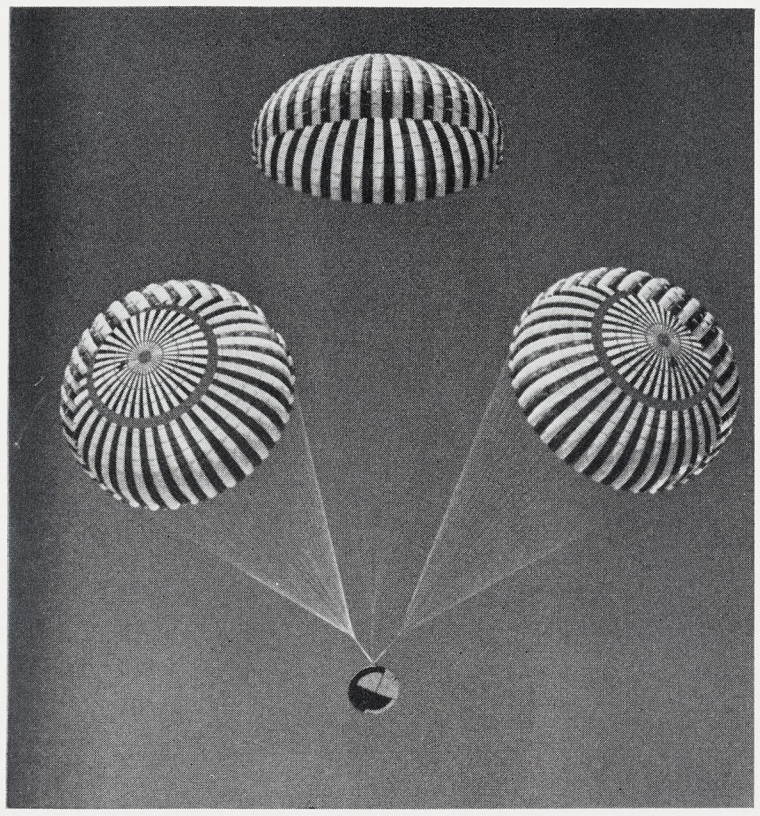


NEW CONFIGURATION—Apollo command module descends beneath cluster of 83-foot parachute in qualifying drop test of improved earth landing system for lunar spacecraft. Originally 88 feet in diameter, parachutes have been reduced in size, as a weight saving measure, without reducing system performance. Another recent design refinement is removal of ring of "sails" (visible above) in each parachute to insure even distribution of load as parachute deploys.

New Approach to Briefings Improves Communications

Improved intersectional communications are resulting in Production Operations department at Northrop Ventura from weekly and monthly briefings which were first tried as an experiment six months ago and which now are normal routine.

The weekly briefings are 10-minute, standup affairs, hosted by Vice President-Production Operations M. A. Maurer. While the main body of participants are directors in Manufacturing, meetings are open.

Subjects to be discussed are posted in advance so that members of management and the Technical department may plan to attend if they so wish.

The monthly briefings are designed to "present all aspects of projects on a scheduled basis for top Division management," with the Manufacturing department again serving as coordinator.

Subject matter for both types of briefings follows outlines set up by Manufacturing's budget analysts and includes the program's financial status, progress in relation to schedule and any problem areas which may have occurred.

Briefings are normally conducted by program managers or one of the three budget analysts, Barney Barnes, George Bundy or Dorothy Prychoda.

GOLFERS TACKLE OJAI IN JULY TOURNAMENT

Ojai Valley Inn and Country Club will be the site of a Northrop Ventura Golf Club tournament beginning at 8 a.m. July 17, Commissioner Ron Moren reports.

Long a favorite with Venturans, the Ojai course is open to tournaments on a limited basis each year. A maximum of 60 players will be accepted from NRC linksmen. Entries are being accepted on a first-come, first-served basis by Joe Cosgrove and Lil Goodwin.

Bill Pai and Roy Nickerson placed one-two in the "A" flight of the June event held at Jurupa Hills, Riverside. Tops in the "B" flight competition were Joe Cosgrove and Bill Kearney respectively. Herb Samuelson copped "C" flight honors with Bill Piggott taking second.

Pat Gosh came in first in the women's bracket.

Military, Scientific Use Planned for Computer

A multipurpose digital computer—described as a low cost, compact airborne device suitable also for scientific and commercial use—is being developed by Northrop Nortronics.

Designated NDC 1051, the versatile electronic package is the latest computer development by the 128-man Computer group at Hawthorne.

NDC 1051 is small enough for a secretary to hold in her hands and has dozens of possible applications, according to Roy Kaufold, director of the group.

It is in that family of military computers presently being developed and used for navigation and fire control and within its capabilities are machine and process control, data processing and scientific computation.

Depending on the rate of production, the NDC 1051 could sell for three to 10 times less than current military computers performing the same functions.

Because of the many potential applications the 1051 is envisioned as an off-the-shelf item.

Initial production costs will be lower than equipment currently available, according to Eddie Klein, chief of Development in the Computer group. Mr. Klein is also responsible engineer on the 1051 project.

The 1051 includes military design requirements for operation in temperatures ranging from a minus 55 degrees C. to a plus 80 degrees C. It also can be set conveniently on the corner of a desk. It is an all integrated circuit machine.

Two technological areas which provide the economical advantages of the 1051 are the logical organization, contributed by Walt Edwards of Mr. Kaufold's technical staff, and its packaging technique, developed by Mr. Klein.

Loy Spears designed the memory unit and Jack Field was responsible for the circuitry.

With a memory unit capacity of 2000 to 8000 words, the 1051 is sufficient for many of its possible applications, but can be adapted to a more elaborate system by adding memory files, typewriter print-out and other auxiliary equipment.

With the dual organization of the Computer group (project and technology), many other specialists have contributed to development of the 1051 and deserve a great deal of credit, Mr. Klein said.

Antelope Valley Women to Host Northrop Social

An unusual "get together" of Northrop's feminine element, plus spouses, is being planned for July 23 at Lancaster by Northrop's Antelope Valley forces.

Plans call for a poolside gathering at the Caravan Inn with hospitality hours at 6:30 p.m. and a buffet dinner at 7:30 p.m. The cost is $4 per person. For those who'd like, room reservations will be made for overnight stays and a tour of Northrop's Palmdale facility scheduled for July 24. Special arrangements are being made for those who wish to change to the more casual attire for the poolside event, including swimming.

Dinner reservations must be made by July 16.

Chilnessa Daly is accepting reservations for Northrop Ventura.

J-A Firm Earns More Honors in Regional Judging

Conejo Designers and Producers, a Junior Achievement firm sponsored by Northrop Ventura, has placed among the top 15 companies in regional competition with 786 other J-A firms from 12 western states and two Canadian provinces.

Pointing out that the award is based on the company's operation from the first meeting to the last, Junior Achievement headquarters in Burbank congratulated Northrop Ventura advisors for "the outstanding job you have done all year."

Conejo Designers, which produced emergency flare kits for autos, had already captured fourth place in Southern California competition for Company of the Year.

Advisors for the past year were Dick Davis, Doug Finch and Doug Sessions. Ed Babcock, who has since been reassigned to Northrop Space Laboratories, provided key assistance in setting up the firm.

IN JEEPS, STETSONS

Ordnance Men at Home on Range

Supervisor Earl Chambers and the six test engineers who work with him at Nortronics have one of the world's largest laboratories—the Great American Desert.

As members of the Ordnance Laboratory unit at Anaheim, they pick their spots to conduct experiments by the square mile. Their addresses vary from "somewhere in the Yuma mountains" to "somewhere in the Mojave desert."

Their trademarks are wide-brimmed stetsons and four-wheel-drive vehicles.

Their job is developmental testing of a diverse arsenal of weapons which Nortronics produces for all branches of the Armed Forces.

Although most of their work is of a classified nature, the field crews can usually come up with an interesting story about their outings. Even talking about the weather is full of new twists.

On a recent experiment conducted in a corner of Camp Irwin Military Reservation in the Yuma Mountains, a crew headed by Jim Hock experienced snow, rain and 100 degree temperatures in one trip.

They may go into a site along a dry trail one morning and discover upon exiting in the evening that the road runs into a mile-wide lake. More often than not, there's no trail at all, and the engineers navigate by compass and the sun.

The men take all the laws of the laboratory with them to the field, and they set up a range to precise specifications. A photographer is usually along to take high speed movies, from which much of the weapon's performance data is taken.

But the volume of data which the crew brings back is more than just successful or unsuccessful firing. Using specialized instruments, the crew attempts to determine such parameters as stress, pressure, velocity, and exposes each component of the weapon to operational environments.

Needless to say, all their work is performed with maximum consideration for safety on government-assigned testing ranges.

Ventura Recreation Club Good Time Table

For enrollment or information on activities listed below, call or contact Recreation Club, Ventura, ext. 480.

ARCHERY, Dale Milligan
Meet 1st Sunday, 10 a.m., Balboa Park Recreation area, Encino. Beginners with or without equipment welcome to free instruction.

BOAT, Gus Johnson
Meet 1st Thursday, 7:30 p.m. DAV Hall, 6543 Corbin Ave., Reseda.

BOWLING, Zack Silvers
Teams compete in mixed leagues on Thursday evenings at Conejo Bowl, and Friday evenings at West Valley Bowl. No formal meetings.

BRIDGE, Tammy Tracy
Weekly bridge games at lunch period in cafeteria.

CAMERA, Dan Cashier
Meet 1st Monday, 7:30 p.m., 18146 Sherman Way, Unit 7, Reseda.

GOLF, Ron Morin
Monthly tournaments on announced dates with meeting at time of tourney.

RADIO, Bob Holly
Meet 1st Wednesday, 11:45 a.m. to 12:30 p.m., Engineering conference room 166. Amateur station is in ham shack at NV antenna range and is available noon hours to licensed amateurs.

RIFLE & PISTOL, Joe Letteriello
Meet 4th Sunday, 7 a.m., Camp Pendleton Range. Compete in Valley league tourneys and fields top marksmen in state and regional matches.

ROCKHOUNDS, George Rigby
Meet 2nd Friday, 8 p.m., 18146 Sherman Way, Unit 7, Reseda, to plan field trips and to use Club lapidary.

ROD & GUN, Dorothy Prychoda
Meet 3rd Tuesday, 8 p.m., DAV Hall, 6543 Corbin Ave., Reseda.

SPORTS CAR, T. F. Twitchell
Meet 1st Tuesday, 7:30 p.m., DAV Hall, to plan regular competitive events which occur on 3rd weekend of each month.

TENNIS, Bob Reese
Meet Wednesdays, Los Posas Country Club courts, 5:30 p.m.; Balboa Park courts, 6 p.m.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 12 | July 28, 1965

F-5 Selected By Canada For New Role

The Northrop F-5 has been declared the winner in a lengthy competition for the selection of a new combat airplane for the Canadian Forces.

Official announcement of the Canadian government's intention to purchase 125 F-5s was made at Ottawa July 15 by Minister of Defence Paul Hellyer. The F-5 was selected after a critical evaluation of several tactical fighters.

Canada will become the third country to acquire the F-5 by direct purchase, the other two being Norway and Spain, and the ninth country to add the F-5 to its defense inventory.

Squadrons of F-5 aircraft already have been delivered to Iran, Republic of Korea and Greece. The first Greek Squadron was accepted by the Royal Hellenic Air Force on the same day Minister of Defence Hellyer made his historic announcement at Ottawa.

Other countries scheduled to receive the F-5 include the Republic of the Philippines, Republic of China, and Turkey.

The Canadian airplanes will be assembled in Canada by Canadair Ltd., of Montreal, under a licensing arrangement.

Built to Canadian specifications, the aircraft will be known as the CF-5 and will have more powerful engines and in-flight fueling capability. Details concerning the production program are being worked out by the Canadian and U.S. governments.

"Within the five-year re-equipment program for the Canadian Forces, $215 million has been earmarked for the acquisition of approximately 125 tactical aircraft, as outlined in the White Paper on defense," Minister of Defense Hellyer announced.

In a subsequent press conference, Minister of Defence Hellyer explained that the $215 million program includes more than the cost of the airplanes, stating it "includes the cost of the aircraft and 30 percent for spare parts, engines, ground equipment, royalties, taxes and other charges."

CMIP Savings Up On 480 Items

Savings reported in the third quarter under Northrop's Cost and Management Improvement Program, more than doubled the best previous quarter of fiscal 1965, it was announced this month by Ken Hornor, Corporate CMIP administrator.

With $4.39 million logged in the third quarter, the total savings in the current fiscal year reached $8.17 million.

The savings resulted from 480 separate items, bringing the total to 1044 for the first three quarters.

Of the three major cost reduction categories, reduction of operating costs has accounted for the

(See CMIP, page 6)

ARMY TARGETS SCHEDULED FOR FINAL ASSEMBLY

Production workers next month will begin final assembly of AQM 38A (RP-76) target missiles, with delivery to the U.S. Army scheduled in September, it was announced this week by Program Manager Ralph Friesen.

Manufacture of the air-launched, supersonic drone is being performed under a contract awarded in February by the Army.

Finance Executives Elevated to Meet Expanding Activity

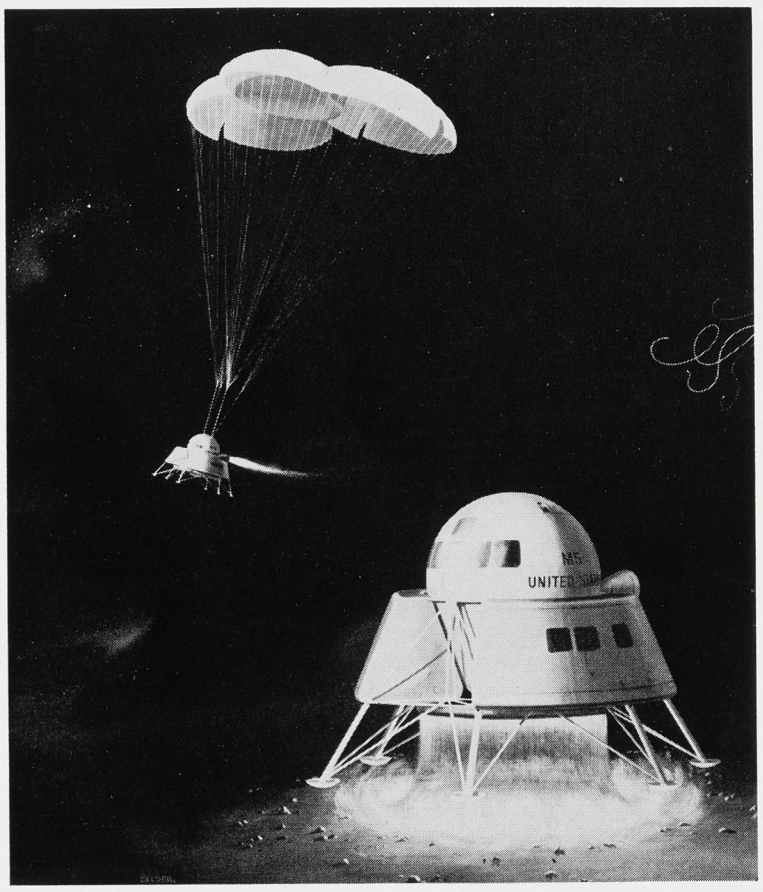
Three key financial executives of Northrop Corporation have been elevated to positions of new responsibility "to meet the expanding scope of our company's international and domestic activities," Thomas V. Jones, Northrop president and chairman, announced last week.

Irving Roth, Corporate vice president, Finance, has been named to the new Corporate post of vice president and special assistant to the President in charge of international financial and economic policy relationships with agencies of the U. S. Government and of governments of U. S. Allies. Mr. Roth will have policy responsibility for all international negotiations involving sale of Northrop products and services. "With our international business increasing, we determined it would be advantageous to have a Corporate officer of Mr. Roth's

(See FINANCE, page 6)

Right: Mr. Roth
Below:
Mr. Macdonnell
Mr. Corie

Parachute-Rocket System For Mars Landing Unveiled



MARS LANDING—Artist's configuration of landing system for manned Mars spacecraft shows Cloverleaf parachute used in conjunction with a horizontal thrust rocket at left and terminal deceleration rocket at right.

Data returned by Mariner 4 spacecraft indicates that surface pressure of the Martian atmosphere is within the range used by Northrop Ventura to design a parachute descent system for manned vehicle landings on the planet.

Various Northrop studies on manned Mars missions which have been conducted since 1964 were described by R. N. (Bob) Worth at San Francisco this week before the second annual meeting of the American Institute of Aeronautics and Astronautics.

Mr. Worth

According to Mr. Worth, a wide variety of Mars atmospheric models were considered, including a 10 millibar surface pressure model developed by NASA.

Mariner data indicates the Mars surface pressure is 10 to 20 millibars or 1 to 2 percent of earth's surface pressure (1013 millibars).

Northrop's proposed descent and landing system includes four major subsystems:

—A drogue parachute of the Hyperflo type to de deployed at a speed of about Mach 2.5 shortly after peak entry deceleration has occurred.

—A main parachute system based on the Northrop Cloverleaf steerable parachute (to be deployed at about Mach 1).

—A sensing and control system to insure proper deployment and sequencing of decelerators and to insure that no super-critical conditions exist during the descent trajectory.

—A terminal deceleration system consisting of a solid fuel rocket engine. A landing leg system absorbs the touchdown velocity

(See MARS, page 6)

NAVY AWARDS NORTHROP UNDERSEAS R&D PROGRAM

Northrop Nortronics has been selected by the Navy as the prime management and engineering support contractor for an extensive underwater research and development program designed to provide new methods and equipment for deep rescue and recovery operations and oceanographic investigation.

Designated as the Deep Submergence Systems Project (DSSP), the five-year, multi-million dollar program is aimed at improving Navy capabilities in four basic undersea operations: speedy recovery of survivors of submarine disasters; creation of deep ocean bases where divers may live and work for weeks at a time; recovery of large ships sunk deep below the surface of the ocean; and the development of a submersible, manned vehicle which can recover aerospace components and conduct oceanographic investigations at a depth of 20,000 feet.

As the systems engineering support contractor, Northrop Nortronics will assist the Navy's Special Projects Office in the management, integration and coordination of all phases of the deep submergence program. This will include establishment of criteria for the design of all systems and the training of personnel and analysis of performance and missions.

FRENCHMAN LEARNS ROPES

Language No Barrier in Parachute Class

The man who will pack and maintain future parachutes for the Sud Aviation high altitude rocket (Super Eridan) recovery system is a Frenchman who received his training at Northrop Ventura despite the fact he cannot speak English and his instructor cannot speak French.

Developed and produced by Ventura Division for the past year and a half, fabricated components of the Super Eridan recovery system will now be refurbished and repacked by Aerazur Constructions Aeronautiques under terms of a subcontract with Sud Aviation.

Yves Chavarin is the non-English speaking Aerazur technician who completed his training in May at Newbury Park. Jim Colunga, who speaks fluent Spanish but no French, was his principal instructor.

The communications impasse was solved by providing Mr. Chavarin with a complete set of chute packing instructions in French. The training program outlined was developed by Stiles Burke, director of Experimental Operations of the Technical department. The training was conducted by pointing to the appropriate section of Mr. Chavarin's manual and then demonstrating the steps involved as he watched.

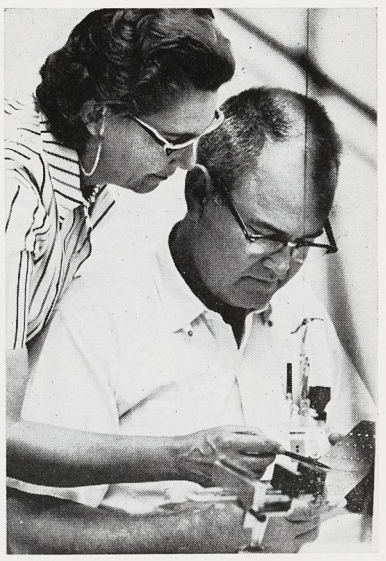
Mr. Chavarin was never without someone to talk to, however. His supervisor, another Aerazur representative, J. P. Bernards, was at Northrop Ventura at the same time to serve as a technical and management representative and to learn more about the electronic operations of the recovery system.

Mr. Bernards is the equivalent of a chief engineer at Aerazur.

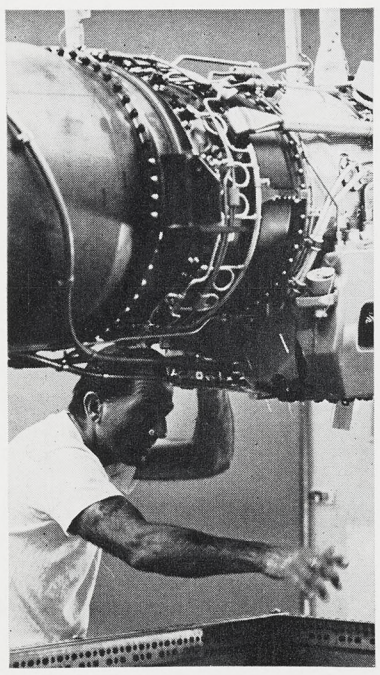
In order to insure that the unusual training procedure had worked, Mr. Colunga set up a series of tests. In addition to as-

(See FRENCHMAN, page 6)

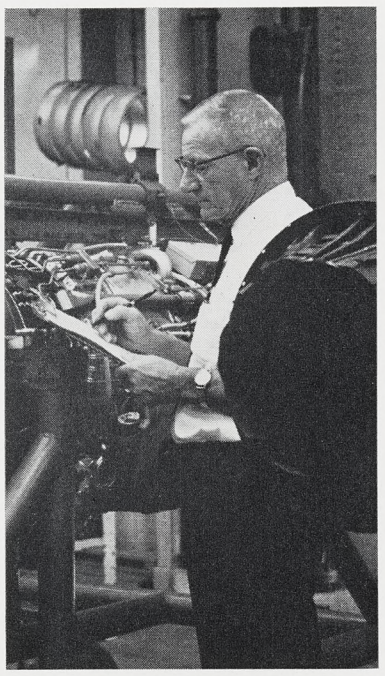
CERTIFIED



One of a group of Northrop Venturans completing NASA soldering certification course this month was Ed Self (right). Eloise Howell was instructor in refresher class required of all NASA contractors.

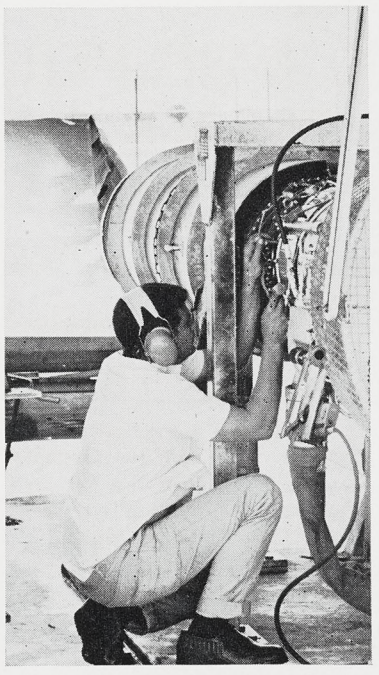


N. R. Williams performs one major Palmdale assignment, buildup of jet engines.

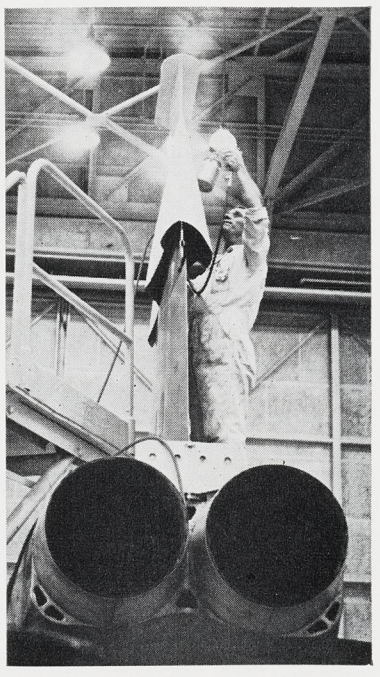


Elmer Blecksmith checks jet engine back in shop after engine run session.

Tom McCracken, Palmdale base administrator since inception, displays model.



B. D. Millican wears ear muffs to deaden roar while making engine adjustments.



Spray gun aids R. D. Casper in touching up tail surface during painting operation.

Palmdale Craftsmen Right in the Middle of Things

Somewhere between those who design and fabricate the T-38 trainers and the F-5 fighters at Hawthorne and the customers who fly them around the world is the Northrop Norair Production Flight facility at Palmdale.

The 270 Norair employees manning that facility like their position—right in the middle of things.

In the true context, Palmdale is an extension of the Norair assembly line at Hawthorne as well as other Northrop divisions and subcontractors who support aircraft programs. It is the point where major components — engines, wings, fuselage, gear, etc.— come together for the first time. It is where the aircraft makes its first flight, goes through corrective actions, then makes subsequent flights until accepted.

Thus, as "middlemen," Palmdale personnel provide the skills to augment and complement all others engaged in aircraft programs.

To better understand Palmdale's over-all impact on the aircraft team effort requires a more detailed look, a quick glimpse beyond the obvious.

First, at Palmdale there are some 400 items actually installed on T-38s and F-5s for the first time. They range from a battery to landing gears, from small components to complete systems. And each system previously installed must be connected during major mating. This requires detailed checks and many adjustments and tests. "Spit and polish" chores like painting and markings are performed as well as detailed buildup and proofing of propulsion systems. Electrical and electronic systems must be verified. Safety checks accompany each step. Preflight operations are detailed and numerous. All of this, and a lot more, precedes the magic moment when jet engines roar to life for the first time and the "bird" functions as a single system. Then, the climax—the first flight.

Ed Minghelli, a Palmdale Flight Operations mechanic, sums it up with: "There is nothing, absolutely nothing, as beautiful as the sight of an airplane, your airplane, making its first test hop."

Since its original inception in 1954, the Palmdale facility has seen many first flights—more than 1700 of them.

This number spans a decade and includes some 1000 Northrop-built F-89 interceptors on their initial flight or first flight following modification; more than 600 T-38s; and over 100 F-5s.

During this remarkable period of operation, Palmdale has never missed a schedule; posted an inviolable accident-free safety record; worked without major damage to aircraft or equipment; and earned many citations for defect-free craftsmanship.

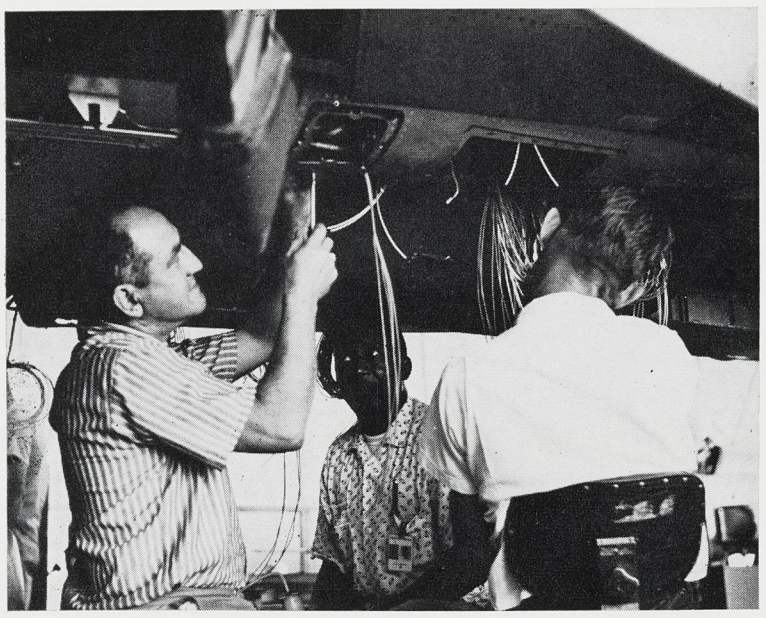
Acceptance flights reflect the over-all end results, since fewer acceptance flights mean resulting savings to the customer and the taxpayer. When the T-38 began an average of 10 or 11 acceptance flights were required. In the initial six months of 1965 more than 33 percent of the T-38s and over 24 percent of the F-5s produced have been accepted on their first flight.

While Palmdale people like to cite this accomplishment, they are quick to point out that it is possible only through the dedication of the Air Force Plant Representative office and skills of all who work on the T-38 and F-5 programs.

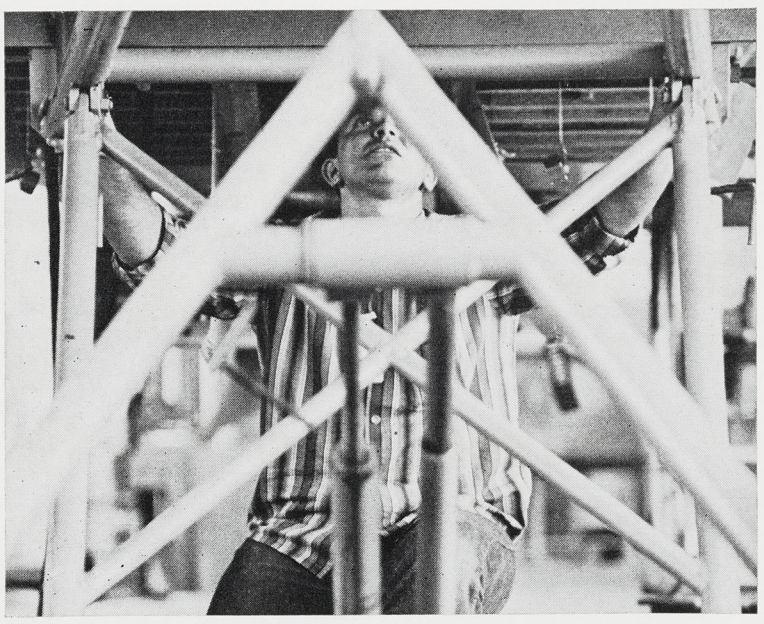
In seeking contributing factors to the success that has become a Palmdale way of life, many ideas are evident. First, the facility is a close-knit, small organization with the shortest possible lines of communication and coordination. It is, above all, a team with every talent required present in its ranks or available on call if needed. A majority of its personnel are long-timers with experience on many programs. Many members of management came up through the ranks and have a strong feeling for the problems of those they lead. There is prompt recognition for ingenuity, ideas and ways of doing a job better at less cost. And most of the employees are close friends and neighbors.

More than anything else, an outsider feels a sense of pride at

(See PALMDALE, page 5)



F. S. Lopez, L. I. Osborne, J. Crawley make one of many electrical checks.



W. A. Lambel gently positions stand under aircraft during mating work.

Fuel truck pumps fuel into waiting T-38 being prepared for flight by George King, P. K. Bolin.

Captain E. E. Hallum, Major R. Sadorf adjust gear with assist from C. E. McGuire, C. D. Wilson.

JOHN CLARK: A HELPER AND FRIEND PASSES ON

A host of Northrop friends and associates were saddened this month by the death of John B. Clark, who died July 19 at the age of 62.

The passing of Mr. Clark prompted this comment from Northrop President and Chairman Thomas V. Jones:

"We at Northrop have suffered a great loss in the passing of John B. Clark. He was a friend whom we will miss in the years to come. I am sure that all of us join in extending to Mrs. Clark and the Clark family our sincere and heartfelt sympathy."

Rosary was recited and a Requiem Mass was celebrated at St. Anastasia's Catholic Church with interment at Holy Cross Cemetery. Mr. Clark is survived by his widow, Peggy, a son and a daughter, John B. Clark, jr. and Mrs. Joseph Hurka.

Mr. Clark

For more than two decades John Clark was a tireless helper and friend to Northrop and Northrop people. He was Northrop Norair director of Industrial Relations for 17 years prior to his retirement last October.

Volumes would be required to cite Mr. Clark's personal accomplishments and contributions to Northrop, to the community, state and nation. He was a man of many causes and many activities.

His humanitarian efforts saw him a member of the President's Committee on Employment of the Physically Handicapped, under the Truman, Eisenhower, Kennedy and Johnson administrations; he was a past chairman of the Governor's Committee on Employment of Physically Handicapped and served with many civic groups working in the fields of crime prevention, children and youth affairs and national affairs.

He served on the Industrial Relations committee of the Aerospace Industries Association, as well as the same committee of the National Association of Manufacturers; he was a long-time member of the Personnel and Industrial Relations Association, the Merchants and Manufacturers Association, and the Hawthorne and Los Angeles Chambers of Commerce.

THREE AFPR OFFICE CIVILIANS EARN SPECIAL RECOGNITION

Special recognition was bestowed on three civilian employees of the Northrop Corporation Air Force Plant Representative (AFPR) office recently.

Lieutenant Colonel Rufus K. Keeling, Northrop AFPR, presented the awards on behalf of the Contract Management Division, Air Force Systems Command.

Receiving 10-year Air Force service certificates were Joshua Treiman, chief of the Industrial Engineering and Support branch; Robert L. Boydston of the Quality Engineering branch of the Quality Assurance division; and Mrs. Bonnie Buckles, secretary to the AFPR.

In addition, Mrs. Buckles received an Air Force Superior Performance Award recognizing sustained superior performance from December 1963 to March 1965. This was Mrs. Buckles' fifth such award in her 10-year career. She has been a member of the Northrop AFPR for approximately four years.

Mr. Boydston has been assigned to the Northrop AFPR for three years, while Mr. Treiman has worked with the same group for approximately two years.

'Plan for Progress' Training Under Way With Northrop Help

Another important step in the "Plan for Progress" program has been taken in the Los Angeles area with Northrop Corporation continuing to play a key part in this national effort.

Currently in session at California State College at Los Angeles is a "Plan for Progress" Vocational Guidance Institute, the first of its kind held on the West Coast. Taking part are 20 public school teachers and 20 minority group specialists from the California State Employment Commission.

The Institute was organized as the result of a request from the Federal Government that William Larrabee, Corporate vice president — Industrial Relations, spearhead industry-wide sponsorship of the program in the Los Angeles area.

The Institute began June 21 and will continue through July 31.

Northrop Corporation, an original signer of the "Plan for Progress" pledge which guarantees equal opportunity for all races, colors and creeds, has participated in making the present Institute possible. Approximately 60 other "Plan for Progress" companies in the Los Angeles area are participating in the program through various methods, including assumption of the cost involved.

Roland B. Scott, executive assistant to Paul Crews, Norair director of Industrial Relations, has represented Northrop in helping to organize the Institute, providing advice concerning the curriculum, and coordinating various activities.

In addition to their classroom work, Institute participants are making weekly field trips to about 60 local firms. These companies have volunteered to assist in the program by showing their operations to the participants, and by full and free discussion of employment opportunities as policies as well as entry requirements for various job classifications in use by the company concerned.

Basically, the Institute is attempting to acquaint attendees with existing and projected employment situations; inform them of problems industry faces in seeking qualified minority employees; helping them understand minority students for better communications; making them aware of school programs and practices that can better serve their students; helping them to help students through an increase in student occupational aspiration levels; and helping industry and minority organizations better understand the problems faced by educational leaders in their guidance and training of minority youth.

PLAN FOR PROGRESS—Recent visitors at Northrop Norair were participants in a Plan for Progress Institute. Group above (from left) are Roland Scott and John Fink of Norair; William K. Herr, California State Employment Service; Carl Pritchard, California State Employment Service; Leon Mason, John Muir High School; and Richard Stanton, Dodson Junior High School.

Warren Prentiss is Kappa Psi Choice

Warren Prentiss, senior engineering writer in Northrop Nortronics' Technical Proposals and Reports unit, has been elected president of the Los Angeles alumni chapter of Alpha Kappa Psi, national business and administration fraternity.

Mr. Prentiss has been active in the alumni chapter since 1947 and has served as publicity director and chapter advisor previously. He invites Northrop employees interested in the group to contact him at ext. 451, Palos Verdes, or at home evenings at 377-6460.

NORTHROP NEWS

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CANADIAN NEWSMAN WRITES

'Northrop F-5 Is Tops for Canadian Air Force'

By R. J. CHILDERHOSE
Staff Writer
The Telegram
Toronto, Canada
(Reprinted by permission)

Strapping into the rear cockpit of Canada's newest jet fighter was a relief. It is the plane I like, fast, easy to fly, easy to maintain.

If Canada needs a tactical jet fighter, the F-5 is the best of the lot.

The Northrop F-5 fighter is sleek, but not large. It can fly supersonic—to and from the battlefield—carry various loads of bombs, rockets, napalm, yet defend itself with cannon and air-to-air missiles.

The fishback fighter was designed for the Canadian force's role described in Defence Minister Paul Hellyer's White Paper of March 1964. This is the tactical support of Canada's U-N brushfire brigade.

Flying the F-5B (two-seat version of the F-5) was John Januleski, supervisor of Production pilots for Northrop Norair. He is blonde, sunburned. He likes to fly.

Both of us were wearing the fluorescent orange flying suits which help rescuers spot you from the air, a survival measure. The gaudy color abets the true fighter pilot's need to show off.

"She rolls pretty good down the middle of the runway," Mr. Januleski said.

The screamy noise of two General Electric J-85 turbojets beneath and behind threatened his conversation. I turned up the volume and placidly viewed the California sagebrush flitting by.

"Wheels coming up." Clunk tink. Red light in the gear-handle extinguishes itself.

Mr. Januleski is not climbing. We are skimming the runway with full afterburning power on. The airspeed needle marches around the dial, 400 knots by the end of the runway — a premonition assails me.

"400 knots," says Mr. Januleski, and points the needle nose at the sky. It's spectacular. That pilot, needless to say, is a showoff.

Seconds later we make 10,000 feet. The F-5 has been clocked to 40,000 in 3.5 minutes. It's a function of the thrust-to-weight ratio. The F-5 has a 7.2 to 1 ratio of power over weight—considerably better than any other jet fighter today.

"You want to fly it?" Jan asked. "Okay, follow that mountain range. Climb it at point nine."

Mr. Childerhose

The Mach needle was at .98—just below the speed of sound. Ginger pressure on the roll brought the nose way up on the horizon. The speed dropped to Mach .95.

The green and black mountains he meant were the easternmost range of the Sierra Nevadas, which form the spine of California. Ahead of us lay the snow-capped High Sierras, all brown rock and snow.

"Level her at 45,000. We'll try a speed run."

I finally stopped it climbing at 47,000. "Throw it into A.B.," said Coach Januleski.

Afterburner. I crammed the throttles ahead and felt the lurch of power. The Mach needle marched 0 on 1, passed it and we were supersonic.

July sky, crinkly mountains, dry-beset, snow-splattered Sierras. I began slow rolling. Just sort of balling it up at Mach 1.23 ten miles high. Showing off for the mountain goats.

On the way back—as we were slowing down and descending for a close look at the mountains—John Januleski demonstrated the fast roll capabilities. World and sky whirled.

"380 degrees per second," he said as we snapped out. Less than a second for a complete roll.

We did a 3G loop — nice and easy — and flattened, weightless at the top as John let her drift. High over our heads was the desert. On the wrong side, the mountains.

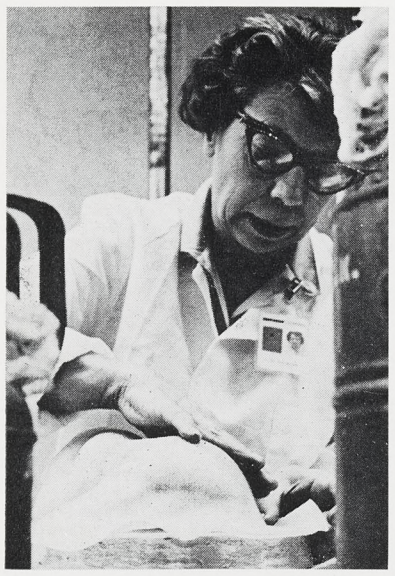
"There's Mount Whitney," said John as we rifled out of the bottom of the loop. "14,000 and something. The highest peak in the U.S."

Ten minutes and 100 miles later we were back at Palmdale.

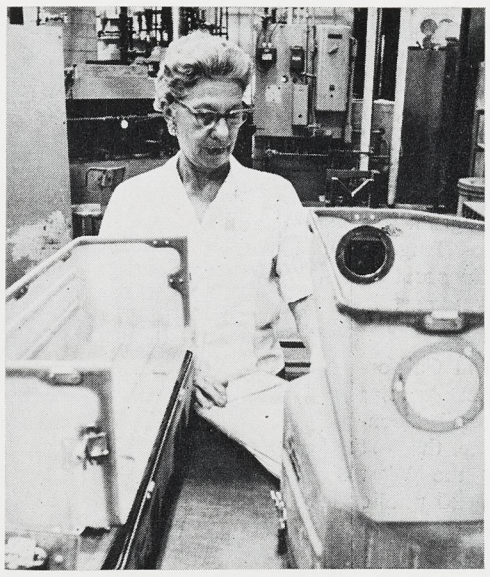
"I'll show you a single-engine landing and go-round," said my pilot.

The significance of landing and then overshooting from the runway on a single engine is that the F-5 can fly away from one of the worst situations a pilot can get himself

(See CHILDERHOSE, page 5)



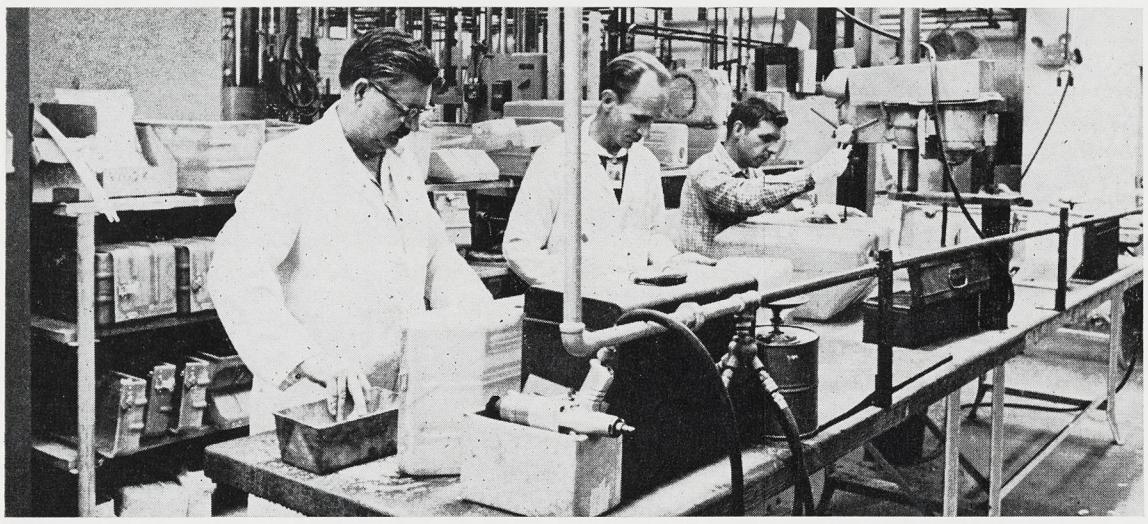
Helen Palenko works on T-38 duct.



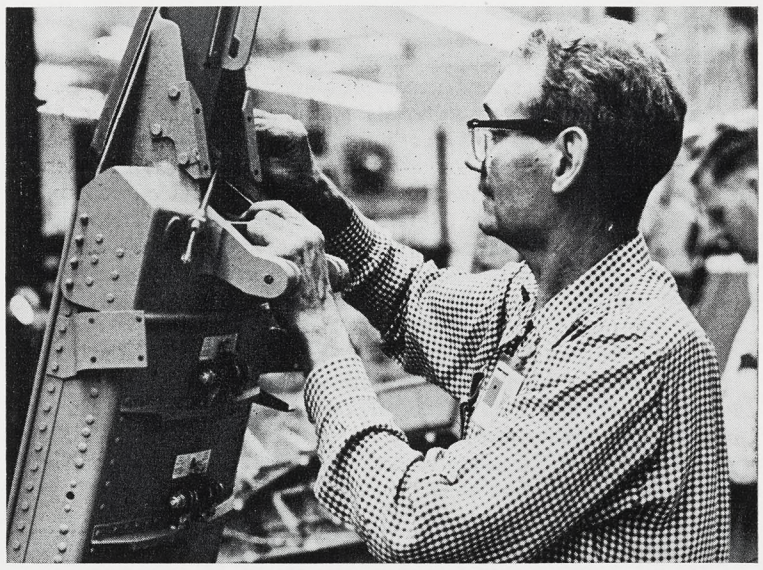
Della Vickers inspects fuel cell assembly.

Wilma Whitfield laminates fuel cell section.

Glenn Wescott in early stages of seat assembly.



Willy Dixon, Ken Anderson and Paul Stewart (left to right) turn out plastic fuel cell assemblies at Ventura.

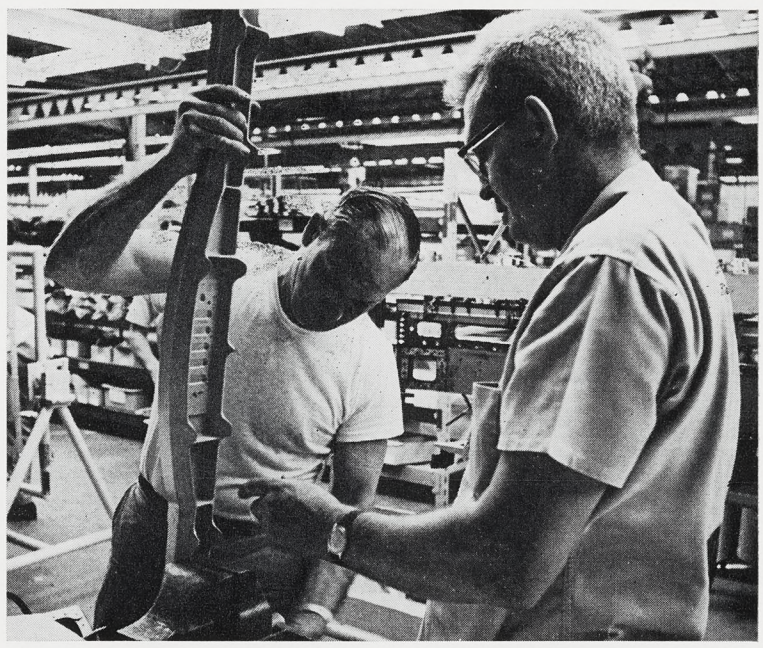


Veteran Northrop Ventura craftsman Mike Reichert puts finishing touch on seat assembly, which will be shipped to Palmdale for installation.

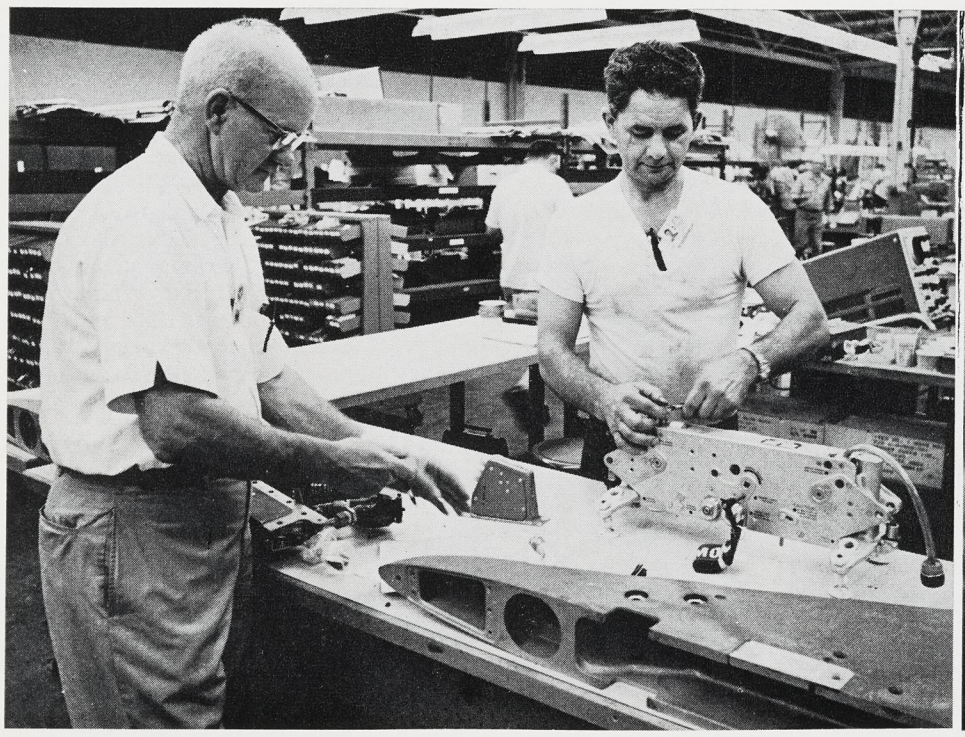
Emmett Evans of Nortronics puts together throttle assembly, one of several items common to both the F-5 and T-38. Mr. Evans is one of more than a score of craftsmen at Anaheim engaged in subcontract work for Northrop Norair.

Northrop pride in T-38, F-5 aircraft is not confined to Norair Division, prime contractor for Air Force trainer and tactical fighter.

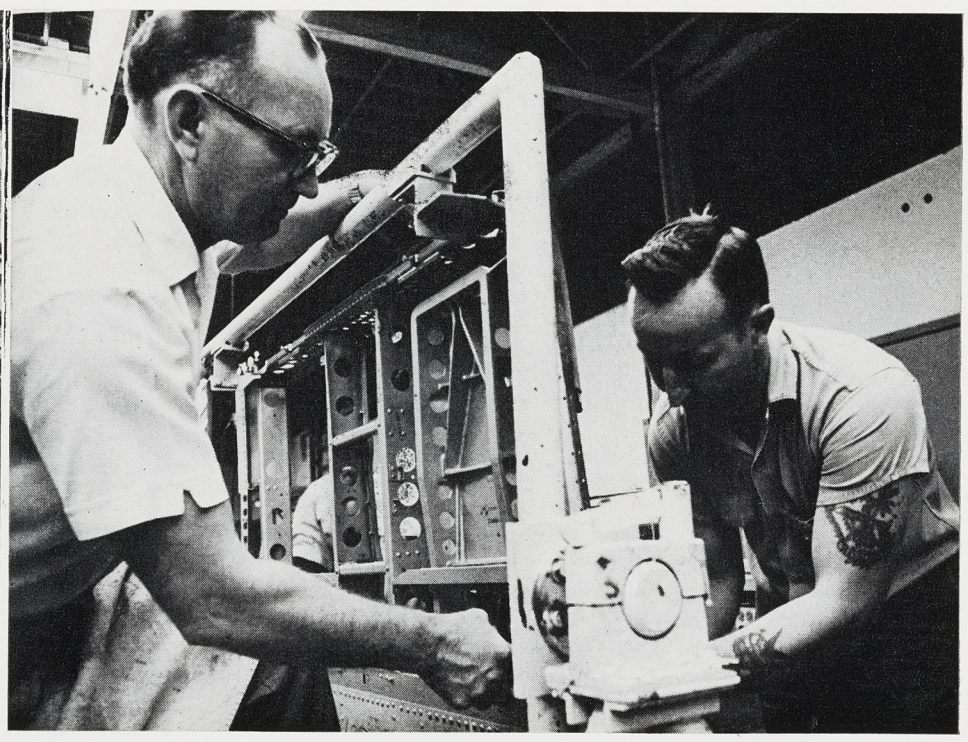
Ventura and Nortronics divisions together supply more than 100 components.



Howard Benton (left) and Frank McIntyre contribute to T-38 speed brake fabrication.



James Linn (left) and Paul Harlow assemble F-5 bomb rack at Anaheim.



Nortronics' L. F. Shadowens (left) and Paul Randolf work on T-38 brake assembly.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Drafting Table, 7′, $20. Anaheim, PR 4-3152.

House, 3-bdrm., family rm., Continental appliances, block wall, 1700 sq. ft., near Santa Ana Fashion Square, prof. landscaped, $31,800. Santa Ana, 633-3657. A

Surfboard, 9′4″ Greg Noll w/new skag, $70. Hawthorne, OS 9-4245. A

Stereo, AM-FM stereo, FM multiplex tuner, Bell model 2421, $80. Torrance, FA 8-0460.

Record Player, RCA Victor 45 rpm, stored 10 yrs., $10. L.A., PL 6-3472. A

Organ, Hammond spinet, model M-3, reverberator & sep. speaker, mahogany, $995. Gardena, DA 9-1323. A

Trailer, 15′, sleeps 5, butane stove, oven, 15 gal. water tank, $485. Inglewood, 755-7692. A

Dinette Set, 7-pc., maple, $65. Long Bch., 428-1789. A

Trailer, 15′, sleeps 4, $250. Gardena, DA 4-6843. A

Refrigerator-Freezer, 10 & 12 cu. ft., upright, Marquette, 7-yrs-old, $125. Gardena, DA 4-0649. A

House, newly remodeled, 3-bdrm., 1½ bath, paneled family rm., covered patio, waterfall, o/door lighting, near San Diego & new Marina Fwys., $29,500. Redondo Bch., 398-6658. A

Speaker & Cabinet, University triax, $25. L.A., AX 3-0036. A

Porsche, 1965, 356 S.C. AM-FM, chrome rims, luggage rack, 13,000 miles, new rear Radial tires, $4300. So. Gate, LO 7-9983. A

Vacuum Cleaner, 1959 Kirby, extra attachments, $80. Box 1201. A

Go-Kart, new motor, $45. Inglewood, OS 6-0049. A

Bed Frames, metal, full size, plastic rollers, $10. L.A., GR 3-3168. A

Dining Room Set, 9-pc., 2 leaves, Naugahyde-covered chairs, table opens to 82″, $95. Torrance, 370-4747. A

TV, Zenith 21″ w/stand, $50. P. V. Pen., 377-5724. A

Chord Organ, Magnus w/table, $20. Torrance, DA 6-0340. A

Range, Vista 4-burner, gas, w/Robert Shaw oven, $20. Torrance, 835-3985. A

Bicycle, boy's 20″, butterfly handlebars, Sting-ray seat, $15. L.A., 292-4958. A

Sectional Set, aqua lamps, bathroom sink, $40. Inglewood, OS 6-1475. A

Heater, natural gas, for heating cabins, garages, etc., $10 & $15. Torrance, FA 0-1897.

Bedroom Set, walnut, hdbd, 2 nite stands, 6-dwr. dresser, & men's chest of drwrs., Calif. Guild, $250. Lawndale, 676-3050. A

Corvair Monza, 1961, auto., orig. owner, $650. San Pedro, TE 3-6037. A

Stove, 1963 Gaffers & Sattler, w/middle grill & glass oven door, $85. Inglewood, 672-6345. A

Trailer, 4′x6′ box, new tires, tailites, $50. Inglewood, PL 5-4497. A

House, for immediate removal from property, 3-bdrm, 1¾ bath, 2-car gar., $250. San Pedro, 833-2512. A

Couch, w/2 chairs, $50. Hawthorne, 675-7424.

Table, w/4 upholstered chairs, $150. Tarzana, 343-7880. A

Twin Beds, maple, scalloped headboard, $20. Torrance, DA 6-5004. A

Washer & Dryer, Frigidaire, 1964 Imperial deluxe, used less than 6 mos., $300. Santa Monica, 393-7464. A

Chevrolet, 1959, V-8 Bel Air, 4-dr., r/h, low mileage, $625. Lawndale, 675-8414. A

Range, Sunray, gas, 36″ 4-burner & griddle, 1-yr-old, $100. Hawthorne, 675-9227. A

Woody, 1948 Merc, M.T. mags., good tires, new eng., $200. Hawthorne, OS 6-0264. A

Corvette, 1956 h/top, 3-spd., red w/black interior, $1150. Palos Verdes Ests., 326-7846.

Impala, 1962, f/air, p/s, 327 eng., $1700. Inglewood, OR 7-1792. A

Camera, Keystone, 8 mm w/turret lens, built-in light meter, Kodak projector, $85. Compton, NE 8-5078. A

Ford, 1959, V-8, 2-dr., auto. trans., r/h, $250. Inglewood, 671-0148. A

Buick Special, 1954 conv., needs top, $200. Canoga Pk., 341-3525. A

Chevrolet, 1957 Bel Air, 2-dr. h/top, 301 cu. in. cam & solids, new eng., $995. Lynwood, NE 5-2359. A

Car Cooler, evaporation-type, floor-type; plugs into 12 V sys., $15. Manhattan Bch., FR 2-6916. A

Truck International, 1961, ½-ton, p/s, o/load springs, split rim wheels, new 6-ply tires, 19,000 miles, $1099. Redondo Bch., FR 6-6415. A

Accordion, 120 bass, case, $125. Gardena, DA 4-0158. A

For Sale

Encyclopaedia Britannica, 1965 de luxe edition, incls. bookcase, $275. P. V. Ests., FR 5-5097. A

Chevrolet, panel truck, 1954, r/h, good tires & brakes, $395. Wilmington, TE 4-0362. A

Typewriter, elec., Remington Rand, $35. Inglewood, OR 3-5568. A

Chevrolet, 1958 4-dr. V-8 Bel Air, r/h, w/s/w, low mileage, $475. L.A., 645-8278. A

Trailer, teardrop camping-type, sleeps 2, foam mattress, 48x80, ice box, pump sink, 2-burner but. stove, $500. Inglewood, OS 6-8893. A

Cedar Chest, small size, walnut ext., $25. L.A., 755-6301. A

Corvair, 1960 4-dr., auto. trans., $450. L.A., GL 4-7654. A

Diamond engagement ring, $100. Hawthorne, OS 6-0041. A

Organ, Thomas electronic transistorized, Serenade, ebony, matching bench, 2 keyboards, 25′ pedals, Leslie speaker plus 3 12″ speakers, many extras, $1550. Hawthorne, 679-4365. A

Fiat, 1960 1200 series 4-dr., good tires, $370. Torrance, FR 5-9946. A

Battery Charger, 6V-8V-12V for car or boat, $4.40. Hawthorne, OS 6-0418. A

Home, 2-bdrm, 2 blocks from ocean, knotty pine paneled, cedar closets, unfurn., recently redec., patio & sun deck, 2-car gar., $35,900. Palos Verdes, 377-8259. A

Sofa, 7′ white Naugahyde, $50. Rolling Hills Ests., FR 8-2190. A

House, 4-bdrm, 2 bath, block wall, sprinklers, near schools, freeway, $29,500. Huntington Bch., 714-897-6815. A

Corvair, 1961, r/h, 4-dr, auto. trans., $625. Inglewood, OR 1-6125. A

Organ, Hammond, spinet, M-3 w/percussion, unmarred maple, $890. San Pedro, 831-5837.

Lawnmower, power, 1-yr-old, used very seldom, $50. Manhattan Bch., 379-6762. A

Mobile Home, 1957 Roadmaster, 2-bdrm., 40′x8′, $2300. Hawthorne, 676-5884. A

Piano, upright, white, $75. Torrance, FA 8-3306. A

House, 3-bdrm., 1½ bath, covered flagstone patio w/brick bbq pit, & matching flower beds, redwood fencing, fruit trees, $16,950. Buena Pk., 828-4388. A

Lawnmower, Sears 2.5 hp, rotary, 1-yr-old, $15. Rolling Hills Ests., 325-3057. A

Poodle, miniature, 8-mos-old, male, silver grey, papers & shots, $75. Redondo Bch., FR 8-4891. A

Mercury, 1955, 5000 miles on eng. o/haul, $150. Hawthorne, OS 5-6883. A

Chevrolet, 1962 Bel Air sta. wag., 6-pass., p/s, p/b, auto. trans., r/h, Hi Grade tires, $1600. Hermosa Bch., 831-9033. A

Chevrolet, 1960 Impala, 421 cu. in. eng., 4-spd., Jardine headers, caslers, chrome rev. wheels, many extras, $1500. Inglewood, 674-1847. A

Kayak, 17′, seats 2, incls. 2 double end paddles, flotation tanks, life jackets, $125. L.A., GR 7-7833. A

Diamond Ring, ladies', $50. Redondo Bch., FR 5-0061. A

Baby bottle sterilizer, Evenflo elec., $5. Torrance, 371-8939. A

Chevrolet, 1957 Bel Air, h/top coupe, V-8, auto. trans., p/b, r/h, $550. Torrance, FR 1-5391. A

Mercury, 1958, 2-dr., h/top, full power, r/h, $350. Hawthorne, OS 6-9462. A

VW, 1963, sunroof, pearl white, $1325. Long Bch., 596-1280. A

Ford, 1955, 4-dr. sed., auto. trans., 70,000 orig. miles, r/h, $170. Rolling Hills Ests., 375-6397. A

Plymouth, 1949 4-dr. sedan, new rebuilt eng. & tires, wrecked, $50. Hermosa Bch., FR 9-7342. A

Table saw, 10″, extensions, stand & access., $110. Gardena, DA 3-3202. A

T-Bird, 1955, full power, both tops, many new parts, $1050 or trade for old car & cash. L.A., 645-7591. M

Boat, 1958 Wizard, 35 hp Evinrude, o/hauled, incls. water skiis & access., $250. L.A., 463-0550. A

Ford, 1959, Cust. 300 4-dr. sed., auto. trans., r/h, new brakes, coil, cond., plugs, good tires, $395. Rolling Hills, FR 7-2552. A

Bicycle, girl's 26″, $10. Hawthorne, OS 5-6206. A

Communications Receiver, National HRO-50-T-1, coil set, matching speaker & receiver desk console, w/National select-o-ject, $180. Inglewood, 672-2515. A

House, custom-built, N. Kentwood, 2-bdrm., 1½ baths, paneled den & living rm., forced air heat, fireplace, beam-ceiling, $34,000. Hawthorne, 670-1721. A

Slot Cars, 1/30 scale, many access., $37. P. V. Pen., 377-6193. A

Corvette, 1955, V-8, good tires, orig. paint, $1000. Redondo Bch., FR 5-3521. A

Opel, station wagon, 1959, w/w tires, new battery, plugs & points, $225. Gardena, DA 9-9982. A

Apt. Bldg., 9 unit deluxe, Inglewood loc., 3-bdrm owner's unit, yearly income of $12,540, $107,500. Torrance, 325-9832. A

Cadillac, 1957, full power, $750. Hawthorne, 679-9834. A

Plymouth, Savoy, 1955, 6-cyl., o/drive, stick shift, $150. L.A., PL 4-0078. A

Bicycle, 3-spd., 24″, English racer, $25. Gardena, 324-3410. A

For Sale

Boat, 14′ glass bottom, windshield, steering wheel, padded seats, controls, 25 hp Johnson, small wheel, tilt trailer, $450. Hawthorne, OS 6-5219. A

Hi Fi Amplifier & preamp, stereo, 17 watts per channel, $60. Torrance, DA 6-7996. A

Go-Kart, West Bend eng., diaphragm carburetor, $80. Inglewood, PL 6-7681. A

Football Shoes, size 8, $6. Inglewood, OS 5-5001. A

Table, redwood w/2 benches, $15. Hawthorne, 676-7712. A

Corvette Stingray, 1964, 365 hp, 4-spd. trans., r/h, $3500. Hollywood, 656-3475. A

Chevrolet, 1959 El Camino, 283 eng., stick shift, new tires, hvy. duty shocks, $900. Redondo Bch., 374-2835. A

TV, 23″, maple Packard Bell, $75. Torrance, 370-4444. A

Chevrolet, 1958, 2-dr., V-8, auto. trans., p/s, r/h, new brakes, U-joints, tires, $235. L.A., 645-7591. A

Falcon, 1960, 4-dr. sed., auto. trans., r/h, w/s/w, $485. L.A., 933-1414. A

Refrigerator, International Harvester, 6 cu. ft., cross-top freezer, $65. Rolling Hills, FR 7-1094. A

Sewing Machine, portable, w/Singer buttonhole attach., $25. Garden Gr., 539-2262. A

VW, 1960, radio, w/s/w, $800. Manhattan Bch., FR 9-0032. A

Table, John Alden hardrock maple, w/4 First Mate chairs & hutch, $100. Hawthorne, OS 9-2156. A

Oldsmobile, 1960, 4-dr. Holiday, r/h, air cond., p/s, p/b, $900. L.A., 645-1274. A

Surfboard, 8′x9″, yellow w/redwood stripe, used 4 times, $75. Box 1202. A

Air Conditioner, 18,500 BTU cap., $170. Palos Verdes, 375-6971. A

Range, 30″, G.E., elec., 2½-yrs-old, $50. Playa del Rey, EX 1-7969. A

Wanted to Buy

Swing & slide for small children, will pay up to $12. Compton, 329-9484. B

VW or **Volvo,** 1955-1960, must be in good cond. & priced reasonable. Inglewood, 755-1071. B

FREE (To Be Given Away)

Pup, mixed cocker, female, 10-wks-old. Torrance, DA 5-3724. D

Kittens, 6-wks-old. Whittier, OX 6-6400. D

Kittens, calico, 1-mo-old. Gardena, DA 4-0300.

Rentals Offered

Apt., 2-bdrm., furn., garbage disp., $130 mo. Hawthorne, 679-8711. E

Cabins, Lake Gregory & Crestline, sleeps 6. June-Sept., $60 wk. Venice, EX 1-2040. E

House, 3-bdrm., detached dble. gar., 20 min. from Nortronics Anaheim, $135 mo. Long Bch., 438-5579. E

Vacation Apt., Bass Lake near Yosemite, at water's edge, pvt. entrance, deck, dock & boat mooring, sleeps 4, $100 wk. for 2; $125 wk. for 4. Rolling Hills, 377-2101. E

Apt., 2-bdrm., 2 baths, gar. & storage space, washing fac., water pd., children ok, $130. Inglewood, 672-5798. E

Home, avail. Aug. 1, 3-bdrm., 1½ baths, covered patio & fenced rear yd., sprinklers, $190 mo. P. V. Pen., FR 7-6458. E

Apt., unfurn. 2-bdrm., 2-bath, family rm., air-cond., patio, gar. w/locker, avail. Aug. 15, $145 mo. Buena Pk., TA 8-2857. E

Apt., 1-bdrm., unfurn., pvt. patio, laundry rm., carpet, triplex, 1-level, adults, $78.50. Gardena, DA 9-9195. E

Summer Home, Lake Arrowhead, 2-bdrm., dorm, 2 baths, pvt. beach, sundeck, patio, furn. except linen, $175 wk. L.A., 397-2317.

Apt., 1 & 2 bdrm., all elect., new, 10 mins. from Nortronics PV, furn. & unfurn., $85-$125. Torrance, FR 5-2091, 375-9397. E

Cabin, A-frame, at Big Bear Lake, Moonridge area, sleeps 6 adults or 4 adults w/children, 1 block from golf course, swimming pool & riding stables, $30 weekend; $80 wk. Palos Verdes Ests., FR 7-3888. E

Apt., sound insulation, fenced, playground-equipped yard, extra lge. 2-bdrm., new, walk to Northrop, $115 mo. Hawthorne, OS 5-6032. E

House, 4-bdrm., 2-baths, 2-car gar., lge. patio, block wall fenced, near Nortronics Anaheim, comp. redec., water, trash pd., avail. July 31, $150. Buena Pk., 521-7622.

Studio Apt., 2-bdrm., 2½ baths, deck, subterranean gar., adults, near San Diego Fwy., lease, $175. Inglewood, 373-1143. E

Apt., 2-bdrm., unfurn., priv. patio, $115 mo. Hawthorne, 676-5622. E

Apt., 2-bdrm., washer, play area for children, 10 min. to Norair, $100 mo. Redondo Bch., 376-4978. E

Apt., 3-bdrm., 1¾ bath, in Southwood area, $165. Torrance, FR 1-1308. E

Lost

Cuff Link for French shirt cuff, silver. Los Alamitos, GE 1-5489. J

Personals

Sewing Instructions wanted for approx. 2 months. Your home or mine, will pay. Will furnish transportation if necessary. Inglewood, 674-1730. L

Ironing in my home, 2 blks. from Northrop, $1 hr. Hawthorne, 675-6291. L

Flying Bonanza to Ohio & East Coast Sept. 3-13. Need 2 pass. to share expenses, $130 ea. round trip. Playa del Rey, 397-6326. L

For Sale or Trade

Monza, 1962, r/h, b/s, auto. trans., 102 hp, $995 or trade for late model long bed truck w/or w/out camper. Alhambra, AT 4-5698. M

Ski Boat, 14′ mahogany & fibreglass, trailer & controls, $350 or trade for 14′-16′ fishing boat. Long Bch., 325-2745. M

Cabin, 2 lots in Big Bear Park, water & elec. avail., $3825 or trade on small house, apt. or boat. Manhattan Bch., 372-3878. M

T-Bird, 1955 porthole w/1957 Pontiac eng. & trans., $1350 or trade for VW. Anaheim, JE 4-8982 or Box 1203. M

Ford, Galaxie 500, 406 spec. cam, solid lifters, positraction, new access., tires & clutch, $1500 or trade $1600 equity in Mustang. Inglewood, OR 7-7355. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Imperial & Firestone Blvd., Norwalk. Ernie Romero, ext. 2200, UN 8-1293. 2

7:30 a.m. — 4:15 p.m.

Roscoe Blvd. & Van Nuys, Panorama City. Lynda Witherwax, ext. 2521, 894-3244. 3

Torrance Blvd. & Prospect, Redondo Beach. Karen Krabbe, ext. 1581, FR 2-9711. 3

Highland & Marine, Manhattan Beach. L. Berg, 2763, 379-6762. 3

8 a.m. — 4:45 p.m.

Sunset & Sepulveda, Los Angeles. Jack Donner, ext. 516, 476-1649. 5

Brookhurst & Adams, or Harbor & Adams, Huntington Bch. or Costa Mesa. Gene Dukette, ext. 438, 962-3763. 5

Rides Offered

8 a.m. — 4:45 p.m.

Sunset & Sepulveda, Los Angeles. Jack Donner, ext. 516, 476-1649. 15

Brookhurst & Adams, or Harbor & Adams, Huntington Bch. or Costa Mesa. Gene Dukette, ext. 438, 962-3763. 15

CHILDERHOSE

(Continued from page 3)

into: having to go around for another attempt at a landing on 50 percent power.

This is one of the reasons this writer thinks Canada will do well to buy the F-5.

The fighter has two engines —one of which is enough to get the pilot home. Control systems are duplicated, more insurance against fatal flak damage in combat.

Simplicity in design, ease of maintenance, the ability to operate in the field—off sod if necessary—with no more than fuel and ammo supplied, makes the F-5 a good plane for Canada.

What the proponents of such Cadillac airplanes want is prestige, status and a multitude of airborne roles. The Canadian Government has decreed that we will fill one role: the tactical support of our mobile ground brigade. The F-5 will perform this role well.

Beyond all that, the F-5 meets the final criterion of fighter planes: it has no bad habits. It's easy to fly. It's fast, it's agile. It's a fighter pilot's airplane.

Winter Keg Leagues Still Have Openings

Positions for teams, couples or individuals remain open in most of the planned NRC-sponsored winter bowling leagues for Northrop personnel working in the Hawthorne area.

League action starts the first week in September and this year features a wide variety of leagues to suit all tastes.

PALMDALE: Right in the Middle And That's Where They Like It

(Continued from page 2)

Palmdale. It extends from the janitor to the mechanic, the typist to top management. It is an unbeatable attribute.

Al Graber, superintendent of Manufacturing Operations, feels that this pride, along with good morale, is directly reflected in the products Palmdale handles.

Jack Mannion, Norair manager of Manufacturing and Materiel and "boss" of the Palmdale effort, cites a number of factors influencing Palmdale performance. He speaks of an always-present "can-do" attitude, experience, a desire to excel, and the willingness to meet every challenge head-on.

"Our people at Palmdale perform as a team and work consistently toward cost and quality records," Mr. Mannion noted. "Tom McCracken sets a fine example that is picked up throughout the facility."

Mr. McCracken, base administrator throughout the history of the Palmdale facility, feels dedication and skill are paramount factors. He cites many examples of ways and means developed at Palmdale to better quality and cost. He calls the Palmdale facility one of the best production flight operations anywhere and his people echo their approval of this designation by constantly trying to do better.

"We expect a lot from each other, every person on this team," Mr. McCracken says, "and when we deliver, as we always do, each of us feels a deep sense of satisfaction for a job well done."

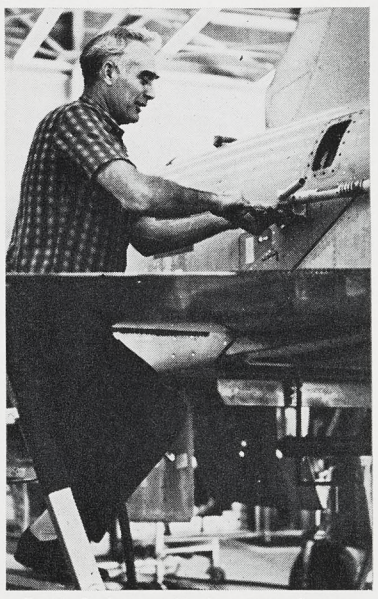
Work on the initial Northrop facility at Palmdale, called Site 2 at Air Force Plant 42, began in mid-1953 and was occupied in early 1954.

The first production airplane arrived at Palmdale in February and first deliveries were made in July of 1954.

Work on the F-89 Scorpion interceptor program phased out in early 1958 and Northrop closed its operations at Palmdale. In early 1960 Northrop returned to quarters at Site 5 for T-38 and subsequently F-5 operations.

Prior to activation of the Palmdale facility, Northrop conducted F-89 production flight operations at Ontario. A majority of the initial Palmdale force shifted from Ontario. In addition, other employees moved there from Hawthorne.

Palmdale offers a variety of advantages for flight testing, including year-around flying weather, uncongested areas, room for expansion, and homes for workers.



Frank O. Large attaches one of many items utilized to check and double-check aircraft.

Production Contracts Under Way

Northrop Ventura is at work on more than half a dozen new production orders, five of which are expanding the Division's work in plastics and reinforced fiberglass.

Ling-Temco-Vought, Inc. has awarded five separate contracts for aircraft components, including fin tips, duct lips, doppler radoms, and two different types of ECM radoms.

Since the aircraft and its components are still in the development stage, the program manager for all five contracts is John Kerr, director of Product Development section in the Production Operations department.

In another new contract received, Northrop Ventura is manufacturing wings, vertical stabilizers, and structural panels for the fuselage section of the Navy's target drone KD2B being produced by Maxson Electronics.

The multiyear contract for metal bonded assemblies will probably require hiring of additional production workers, according to Program Manager Ralph Friesen.

Meanwhile, the Production section is continuing to supply the Norair Division with T-38 and F-5 components, including seats, fiberglass parts, tanks, and pods.

The Division first began interdivisional work for Norair four years ago, according to John Miller, program manager and director of the Production section.

CMIP

(Continued from page 1)

biggest share of savings to date with $4.1 million.

Buying at lowest sound price has accounted for $2.06 million, and buying only what is needed has saved $1.98 million.

"We are extremely pleased with the continuing interest in the program, as evidenced by the fact there have been twice as many items reported in the first three quarter of fiscal '65 as there were in all of fiscal 1964," Mr. Hornor said.

It was also announced this month that Northrop has accepted a recent invitation by NASA to participate in its cost reduction program.

Northrop's third quarter report coincided with Secretary of Defense McNamara's yearend tally of the Defense Department's cost reduction effort, which exceeded the forecast made a year ago.

VISITORS FROM FRANCE—J. P. Bernards (left) and Yves Chavarin (center) of France's Aerazur Constructions Aeronautiques receive certificates at conclusion of training in maintenance and recycling recovery system for Super Eridan rocket. Northrop Ventura's Stiles Burke makes presentation.

FINANCE: 3 KEY EXECUTIVES TAKE ON NEW RESPONSIBILITIES

(Continued from page 1)

stature to conduct international negotiations and otherwise see to it that our business arrangements are handled so as to maximize the financial return to the company," Mr. Jones said. "We must have the greatest sensitivity to our Government's policies on military assistance programs, trade promotion, inter-government credit, balance of payments and our relationship with international financial officials," he added.

Joseph Corie, who has been Northrop controller since 1959, was appointed Corporate vice president—Government Procurement Policies. This is a new office established to assure "that our company makes the fullest use of the opportunities afforded us to make our own experience available to government policy-making officials and at the same time keep our organization alert to ways in which maximum profit can be assured under new or existing procurement regulations," Mr. Jones stated.

J. Grant Macdonnell, who has been treasurer of Northrop's Norair Division since October 1959, was named Corporate vice president and Corporate controller.

Robert M. McNamara, a Northrop veteran, has been promoted to fill the vacancy created by elevation of Mr. Macdonnell to his new office.

Mr. Roth joined Northrop in 1956 as assistant to the president and was elected vice president in charge of Finance in 1958. Prior to joining Northrop, Mr. Roth held responsible positions in the Department of Labor and the Department of Defense in Washington, D. C. In 1951 he was named chief, Aviation Branch, in the Office of the Secretary of Defense. A recognized authority on aircraft fiscal matters, he represented the U. S. Department of Defense in reconstituting the Japanese aircraft industry and assisted in negotiating the bilateral agreement to build jet military aircraft in Japan. Mr. Roth is a graduate of Southeastern University, Washington, D. C.

Mr. Corie served in the Department of Defense from 1948 to 1956, was assistant director of Budgets in the Office of the Secretary of Defense and was a staff member of the first and second Hoover Commissions. He is a member of the Bar of the Supreme Court of the United States and the U. S. Court of Appeals for the District of Columbia. He has represented Northrop on numerous industry, professional associations and government-industry programs and is an active member and a former chairman of the Procurement and Finance committee of the Aerospace Industries Association.

Mr. Macdonnell has held important roles in the company's financial organizations since he joined Northrop in 1942 as an accounting supervisor. He has been treasurer of the Norair Division since October 1959. Mr. Macdonnell graduated in 1930 from McGill University, Montreal, Canada, and had wide experience in banking and finance before joining Northrop. He had previously been with the First Trust and Savings Bank of Pasadena, California, and prior to that with the National Trust Company of Montreal, Canada.

Initial F-5 Squadron Delivered to Greece

A squadron of Northrop-built F-5 tactical fighters has added a supersonic punch to North Atlantic Treaty Organization (NATO) defenses in southeast Europe with their delivery July 15 to the Royal Hellenic Air Force during ceremonies held at Athens, Greece.

King Constantine of Greece headed a contingent of government and military officials at the ceremonies. Northrop Corporation representatives included President and Chairman Thomas V. Jones and Richard E. Horner, senior vice president and general manager of Northrop Norair.

Deployment of the squadron in Greece marked the debut of the F-5 in the NATO command. Two other allies, Iran and the Republic of Korea, have already received their first deliveries of the fighter under the U.S. Military Assistance Program, but are not NATO members.

The versatile F-5 — the only supersonic aircraft in the free world capable of combat operations from unpaved runways—is also scheduled for deployment to Norway, Turkey, Spain, the Republic of China and the Republic of the Philippines.

The F-5s delivered July 15 will be assigned to the 341st Squadron of the RHAF's 111th Combat Wing which until now has been equipped with the subsonic F-86 aircraft.

In addition to King Constantine, officials taking part in the official delivery ceremonies at Athens included Lieutenant General G. N. Antonakas, chief of the RHAF General Air Staff, Lieutenant General Benjamin Webster, commander of Allied Air Forces in Southern Europe, the NATO command responsible for air power in the Mediterranean area, Norbert Anscheutz, the U.S. charge d'affairs in Greece, and Major General Harry L. Hillyard, chief of the joint U.S. Military Assistance Advisory Group in Greece.

FRENCHMAN

(Continued from page 1)

sembly and packing operations, Mr. Chavarin was given problems in solving simulated errors in the recovery and drogue parachutes during the packing process.

Mr. Bernards, Mr. Burke and Mr. Colunga were all completely satisfied that the program had been a success.

Now back in France, Mr. Chavarin has with him a complete set of packing instructions (in French), which includes more than 100 photographs of the many steps involved.

Aerazur, which has facilities in Paris and nearby Cognac, is the leading French company in the field of paradynamics and space re-entry programs. The company also produces life saving equipment, radar antennas, and multiple housing units.

The Super Eridan recovery system is similar to those developed by Northrop for American manned space programs. One of the principal components of the system is a 41-foot Ringsail main parachute.

Sud Aviation, one of the leading French companies in aircraft production and space research, is principally owned by the French government.

GUEST SPEAKER SET

Pepperdine College Vice President William Teague will be guest speaker at the Northrop Ventura Management Club dinner meeting September 15 at the Woodland Hills Country Club, it was announced this week by W. C. Green, Club president.

MARS

(Continued from page 1)

and prevents toppling during the craft's final skid.

"During the studies, a general operational analysis of the manned Mars mission was conducted to provide a basic framework for evaluation," Mr. Worth said.

The system has been evaluated for vehicles weighing between 20,000 and 200,000 pounds, he added.

In addition to the terminal deceleration engine, a separate propulsion system was utilized in the Northrop design. Located on the side of the vehicle, near its centerline, the small horizontal thrust engine would be liquid fueled and would augment the glide of the Cloverleaf.

Northrop Ventura conducted a study on manned Mars landing for NASA's Ames Research Center in 1964 and is continuing its effort.

The studies have been aimed at a system which will provide the spacecraft pilot with sufficient horizontal travel capability, control and descent time that a variety of suitable landing sites may be considered.

ENGINEERS, CRAFTSMEN, ADMINISTRATORS AT NORTHROP VENTURA PUT ON SOFTBALL UNIFORMS ONCE A WEEK.

Pitcher Dean Hadden unleashes fast one, as shortstop Don Keller picks his fielding spot.

Pat McDaniel slides for third. Lieutenant McDaniel is spring graduate of AF Academy in summer program.

Chuck Taylor, first baseman and manager, unloads long triple during recent game, but was thrown out at home plate.

Northrop Ventura's hopes for victory in Conejo Valley League championship rest on second half record. Team (pictured above) has been steadily improving. NVRC Photos by Dan Cashier.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California — Vol. 23, No. 13 — August 11, 1965

Flight Could Clarify Effect On Chutes

While NASA has scheduled 17 specific experiments for this month's two-man Gemini flight, the Northrop Ventura recovery system program staff is most interested in removing yet another question mark — the effect of space environment on parachute materials.

Their hopes rest mainly on the accuracy of the spacecraft's landing at the conclusion of the eight-day mission.

A helicopter was assigned to recover the chute from Gemini 4 in June, but the canopy sank before it arrived. Another helicopter will be standing by to recover the Gemini 5 chute, but again it will only have a few minutes before the 109-pound canopy goes under.

The parachute portion of the Northrop Ventura landing system is jettisoned immediately upon contact with the ocean.

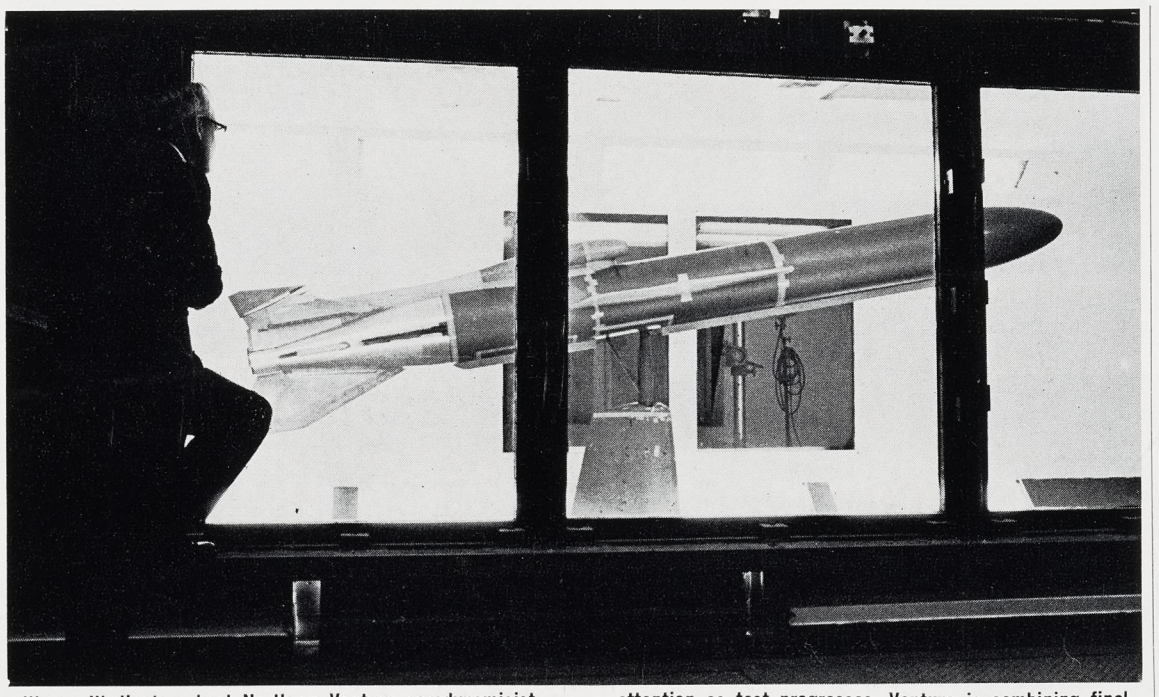
Northrop engineers have conducted laboratory and mathematical studies of the effects of weightlessness, radiation, vacuum and other aspects of space environment on parachutes, but they would like to examine the recovered chute in order to confirm their analyses.

Technical Assistant Named by Grogan

Charles H. Green, jr. has been named technical assistant to George Grogan, vice president and manager - Technical.

Mr. Green, a graduate of Georgia Institute of Technology, has more than 15 years of engineering and management experience in the aerospace industry.

He was manager of Advanced Missile Systems at Vought Aeronautics Division of Ling-Temco-Vought prior to joining Northrop Ventura.



Wayne Wadington, lead Northrop Ventura aerodynamicist on a task force conducting tests on NV-105 drone at Northrop Norair wind tunnel complex, pays very close attention as test progresses. Ventura is combining final engineering tests with customer demonstrations for the new target. Other photos on pages 2 and 4.
(Photos by Bob Thornton)

Northrop Among Leaders Lauded by White House

Northrop was among several Southern California industrial firms commended by the White House recently at a "Plans for Progress" Vocational Guidance Institute held at California State College at Los Angeles.

The Honorable Hobart Taylor, jr., associate counsel to the President, sent a special message to those taking part in a concluding seminar held July 30.

Mr. Taylor expressed his disappointment in not being able to attend and offered his congratulations and appreciation "to the Plans for Progress companies for their support and cooperation and especially to the Northrop Corporation for its leadership; to the administration and faculty of the College; and to the dedicated teachers, counselors and placement officers, many of whom gave their own time to learn how they might better serve their fellow Americans.

"Such cooperative and voluntary efforts across the land are making a significant contribution to the realization of the American dream for all citizens."

William Larrabee, Northrop Corporation vice president—Industrial Relations, spearheaded the drive which made the Institute, first ever held on the West Coast, possible.

Frank Smith, Corporate director of Industrial Relations, was spokesman for the Plans for Progress companies at the seminar.

Roland B. Scott, executive assistant to the Norair director of Industrial Relations, was a key worker in promoting the Institute. Special help was also provided by A. C. Sorenson, Northrop consultant, and Clarence Stine, supervisor of Industrial Training.

VENTURANS GET SERVICE AWARDS; GALS RATE HIGH

The presentation of Northrop service pins has been on the increase at Northrop Ventura during July and August with eight employees receiving 15-year pins and 17 receiving 10-year pins.

The ratio of female employees earning long service awards has shown an upswing. There were four included in the 15-year recipients and three earning 10-year service recognition.

Fifteen-year pins are going to Martha Cleous, Ralph Thenhaus, Claudia Madden, Theresa Baxter, Sibyl Sanchez, Hubert Easton, Lloyd Eastman and Gerald Siebers.

Receiving 10-year pins are Jack Smith, John Bean, Hal Barber, Al Seaman, Edwin Kraft, Joe Letteriello, Merle Heidmann, Gus Johnson, Ron Magee, Karl Stoy, Richard Shewmaker, Tony Buchiarelli, Ted Shaw, Warren Lortie, Ruby Hill, Celia Magee and John Baker.

Wind Tunnel Tests End For NV-105

Final engineering flight tests will be combined with customer demonstrations for the new Northrop Ventura 105 drone in a display of confidence by the Division in its low cost, turbo-jet powered target.

While analysis of wind tunnel tests remains to be completed, preliminary data has done nothing to change the original schedule which calls for demonstration flights at Pt. Mugu in early October, it was announced this week by J. D. Conlan, project manager.

Mr. Conlan

Wayne Wadington, lead aerodynamicist on the NV-105 task force, reported that tests in the Norair wind tunnel at Hawthorne might lead to some engineering changes in the vehicle, but "these were expected."

Engineering changes are not interfering with fabrication of five more NV-105's to be used for flight tests—under the direction of Blair Chapman, foreman of the Model shop.

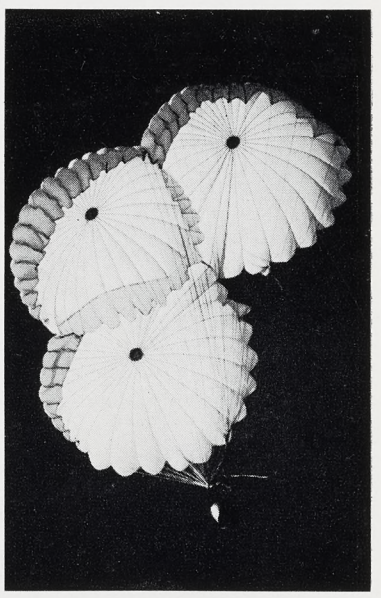
Four members of the engineering task force—Jack Fisher, Jack Connor, John Clark and Dick Cronin—have shifted to the Model shop to accomplish the design and refinement necessary during assembly of the five test vehicles.

Meanwhile, the wind tunnel model is back at Northrop Ventura being modified for dummy ground launch tests designed to investigate the booster phase.

Dividend Declared By Credit Union

Northrop Ventura Credit Union has announced net earnings of $17,872 for the first six months of 1965 and declared a dividend of 4.5 percent for its 1155 members.

CLOVERLEAF



Cloverleaf steerable parachute, which figures largely in Northrop Ventura landing system proposed for manned Mars flights, is traced back to its beginnings by co-inventors Vince Riley and Gene Linhart in another installment of Pioneers in Paradynamics series . . . Page 3.

THEN THERE WAS THE TIME . . .

Masked Marvel Whiz With Kids, Drones

By a staff writer

When you talk about drones with veterans of two decades or so at Northrop Ventura, the conversation will come around eventually to the Masked Marvel.

Especially now that he's back in action with the Division's entry in the Conejo Valley softball league.

Mr. Andrews

The awesome appellation was affixed to Jim (Andy) Andrews, a Production supervisor at present, when he burned up city softball leagues as a pitcher in El Paso, Texas, during the period Northrop maintained a target support operation for Army missileers and anti-aircraft sharpshooters.

But memories of the Masked Marvel go beyond softball. It's kind of a nostalgic reminiscence of the postwar period when a determined group of men picked up scrap metal off a firing range and somehow shaped it into a flying target again.

Then, as now, the Army had a pretty good aim, and there wasn't much left of an OQ-19 or RP-76 drone when it took a hit.

We cornered Andy Andrews the other day and demanded an explanation of these rumors that the Masked Marvel had returned.

(Andy headed the original group of 15 men who set up the El Paso operation in 1955. Others still with Northrop are John Baker, assigned to the RP-76 program; Hal Steuwer, now at Nortronics Division; Joe Dilley of Production; and Mel Miller, who is still at El Paso.)

"The mask was kind of a gag to scare the opposition when I pitched for the Kiwanis Club," he said.

Andy is also remembered without the mask for his work with the Boys Club of El Paso.

"There were a few youngsters that kind of got off on the wrong foot around town," he said. "We are real proud that the little bit of attention, kindness and guidance we gave them while they were young has helped to make them outstanding citizens of the community."

Andy served on the board of directors of the Boys Club.

Then there were the Christmases when the entire crew got together and repaired toys for the city's underprivileged children.

Between the toys and the more

(See ANDREWS, page 6)

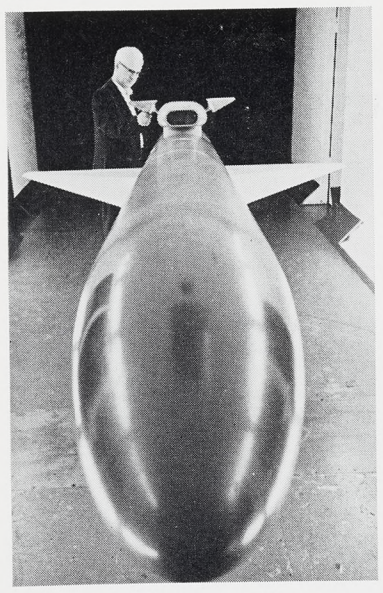
NVRC's Annual Family Picnic At Vasa Park

Northrop Ventura Recreation Club has scheduled its second annual employees picnic September 25 at Vasa Park on Truinfo Canyon Road near Cornell Corners.

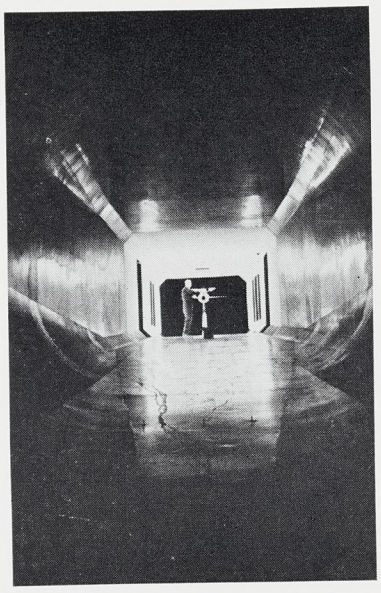
Tickets are now available from all NVRC commissioners, according to John Lawrence, president of the club.

In its brief history, the picnic has become the biggest event of the year for employees and their families. The first picnic was held at Saxsonia Park, Newhall, in the fall of 1963.

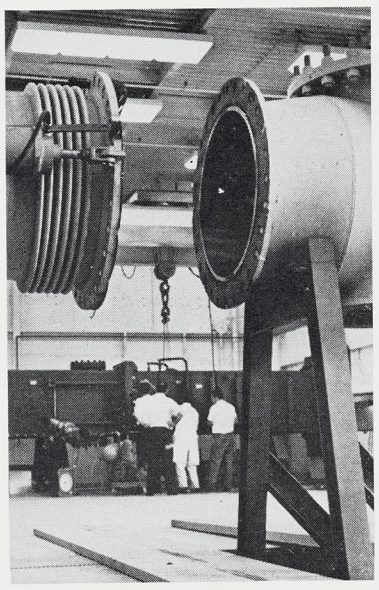
A full day of activities has been scheduled, including baseball, swimming, puppet and monkey shows, contests, and door prizes will be awarded, Mr. Lawrence said.



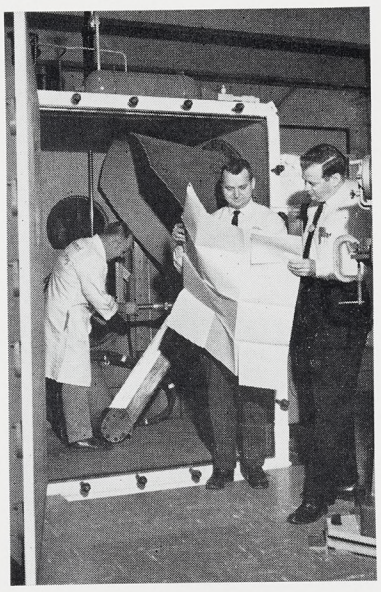
Northrop Ventura's Bob Kinsey, an aerodynamicist, checks NV-105 drone prior to low speed wind tunnel tests.



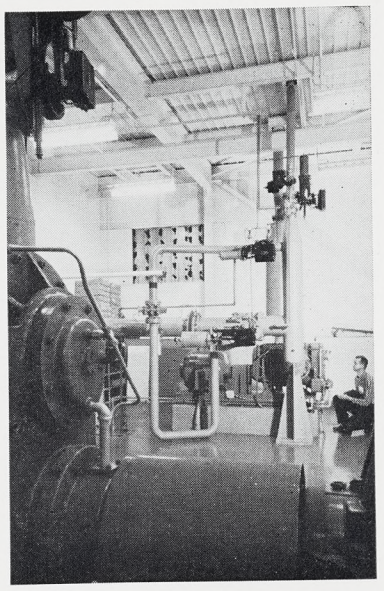
Long wind tunnel seems to belittle size of NV-105 target drone undergoing test program.



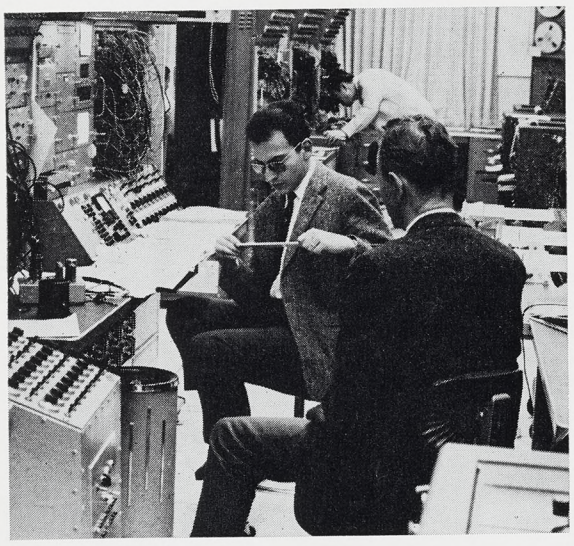
With portion of hypersonic wind tunnel in foreground, Norair crews prep two-foot supersonic unit for tests.



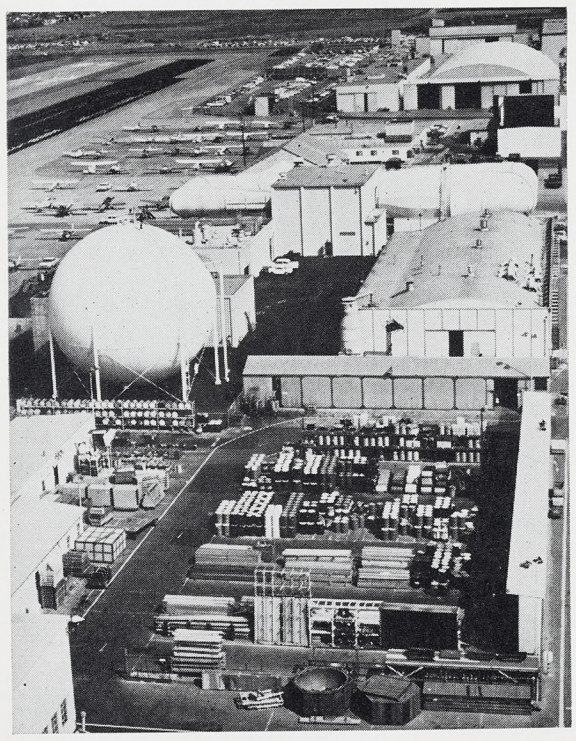
Bob Hobbs, Hank Karaszewski and Walt Watson make last minute checks and adjustments.



Primary and secondary exhaust system for inlet and duct test facility stands ready to perform.



Norair's flight simulator analog computer, another tool in research program, appears complicated above as Al Flores, Hal Kamatani and Bill Taylor work. Below is over-all view of wind tunnel complex with vacuum sphere at left fronting hypersonic and supersonic tunnels.



FROM DROP OF PIN TO MACH 14, WIND TUNNEL SERVES NORTHROP

Experimental aerodynamic studies on advanced aircraft, missile and space systems at velocities ranging from the slightest movement to 14 times the speed of sound (Mach 14) are possible in Northrop Corporation's unique wind tunnel complex.

Located at Norair Division and operated by the Research Laboratories group under Chief Paul Jensen, the complex and its supporting functions afford Northrop capabilities unusual and, in some aspects, unmatched in the aerospace industry.

For instance, the Research Laboratories boast the ability to design, fabricate, test, record and compute data all within a single function.

Manned by a highly flexible and talented group, the wind tunnel complex has gained a reputation for its ability to perform assigned tasks swiftly and economically.

Currently, about 80 percent of the complex activities are in direct support of Northrop programs, with the remainder devoted to outside firms and governmental agencies.

Major facilities with the complex consist of a subsonic wind tunnel and a dual circuit transonic/supersonic-hypersonic wind tunnel. The subsonic unit tests up to about 400 miles per hour. The transonic/supersonic circuit covers a testing range of Mach 0.4 through Mach 5, while the hypersonic circuit ranges from Mach 6 through Mach 14 (14 times the speed of sound).

The transonic/supersonic-hypersonic circuits are powered by the same air supply, 2000 cubic feet in 60 air storage bottles with pressure capabilities of 3200 pounds per square inch.

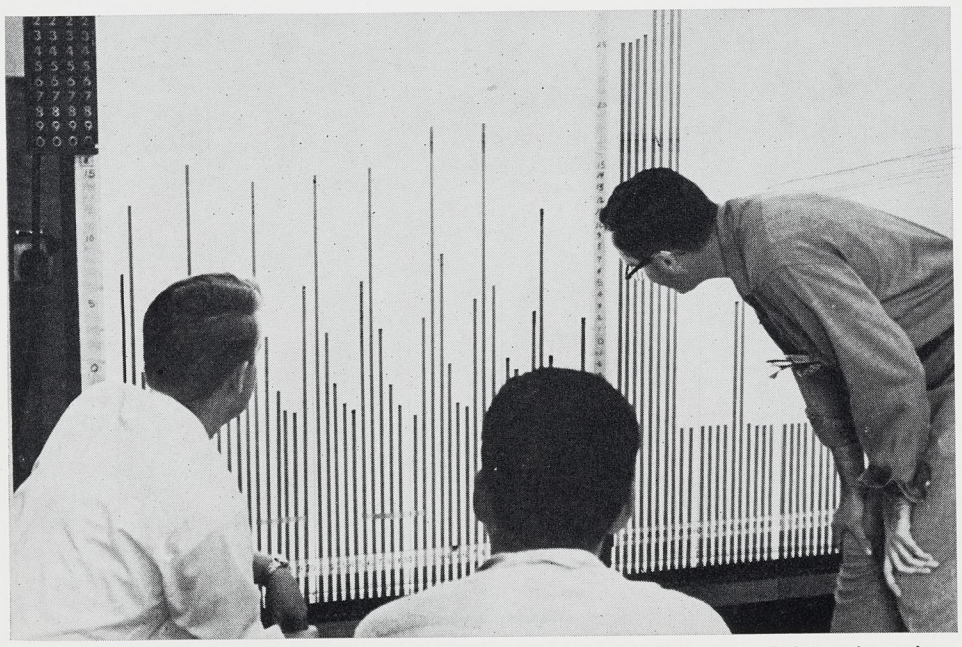
The hypersonic circuit has its own heating and cooling units, plus a giant (100,000 cubic feet) vacuum sphere. The latter, with a 22-foot diameter door, can also be utilized as an altitude chamber (with a 57-foot diameter) in which altitudes of 235,000 feet can be simulated.

Also available in the Research Laboratories are completed design and fabrication capabilities, an Inlet and Duct Test facility, plus a bevy of smaller testing facilities of many types.

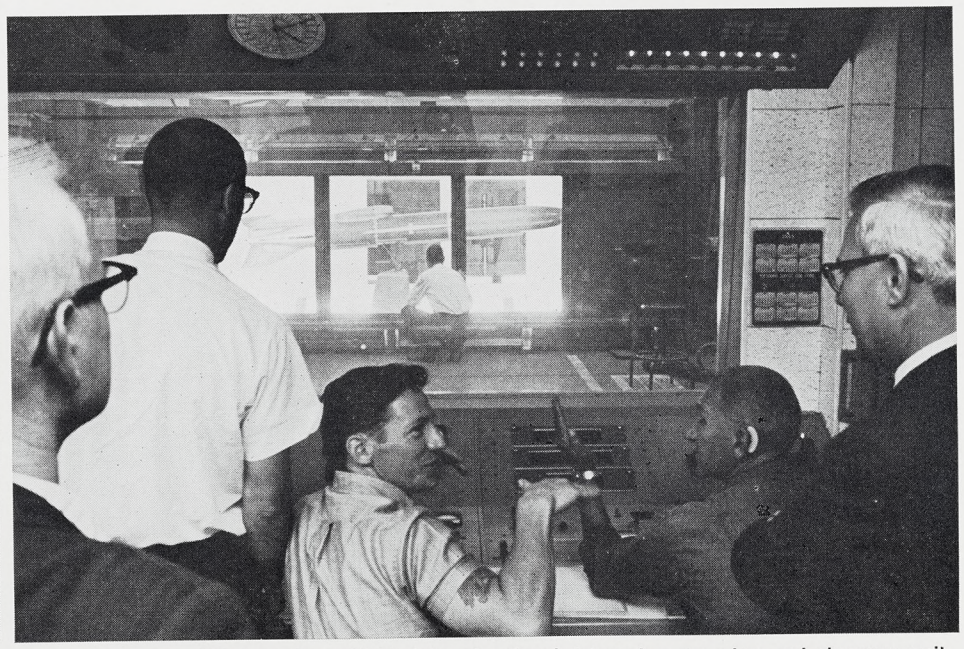
Northrop's original subsonic wind tunnel, with a test area measuring 8 x 11 feet, is also available for conducting tests of up to about 150 miles per hour.

The newer subsonic wind tunnel installation (a 7 x 10 foot unit) has been in constant use since 1956 and has been utilized in the development of the T-38, F-5, X-21A, etc. The present transonic/supersonic-hypersonic facility went into operation in August of 1962.

Key Norair figures in wind tunnel operation include Frank Wiedenhofer, Harry Graves, Hank Karaszewski and Wally Henrich in impromptu confab above. Below Jerry Vinnisch and Joan Martin man posts as high speed data acquisition System records results of wind tunnel test in progress. Information is ready in matter of minutes.



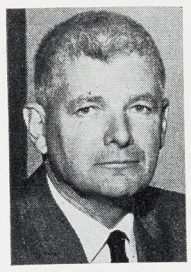
Monometer board gets close attention of Norair trio as tests progress. Northrop's wind tunnel complex also includes wide variety of small, but related test facilities such as inlet-duct testing unit, etc. High speed data acquisition systems make test results available in minutes.



Northrop Ventura 105 drone is spotlighted in subsonic wind tunnel as operators and observers wait for beginning of tests. Norair-based wind tunnel complex supports all Northrop divisions, represents unusual capability. Complex includes subsonic, hypersonic and supersonic abilities.

Ross Heads Palos Verdes School Board

Morwick "Moke" Ross, a member of the Northrop Norair general management staff, was installed last month as president of the Board of Education of the Palos Verdes Unified School District.



Mr. Ross

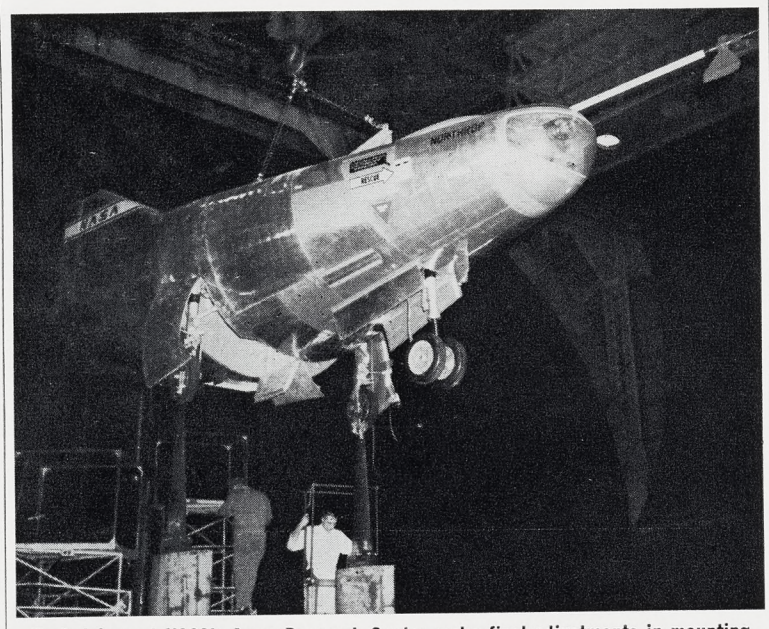
Appointed to the Board of Education in October 1962, Mr. Ross was elected for a full four - year term on the Board by the citizens of that community in April 1965. He was subsequently elected Board president by the members of the Board with installation in July.

A native of Boston and graduate of Northeastern University and former student at the Harvard Graduate School, Mr. Ross joined Northrop Corporation in 1954. Previously, he held executive positions with the Civil Aeronautics Administration. He is a retired U.S. Naval Reserve lieutenant commander.

At Northrop, Mr. Ross has served as an assistant to the Norair vice president for Administration; as assistant to the general manager in charge of the SM-62 Snark program; and as program manager for Manned Aircraft during developmental work on the T-38 and N-156 (F-5). He served for one year in Norair's Washington office and for the past three years has been engaged in new business planning activities.

Mr. Ross and his family are residents of Palos Verdes Estates.

BIG WIND COMING



Technicians at NASA's Ames Research Center make final adjustments in mounting Norair-designed and built M2-F2 lifting body research vehicle in Ames wind tunnel. Following wind tunnel tests, M2-F2 is slated for return to NASA's Flight Research Center, Edwards AFB, for actual flight tests.

YUNT COLLECTS TWICE WITH DRILL CLAMP

A quick action drill press clamp — which may find its way into thousands of homes, as well as industrial workshops — has paid off two ways for Fred Yunt of Norair Manufacturing Research and Development.

He received his first royalty check from a licensing agreement negotiated by the Northrop Product Licensing office represented by Stan Peterson, with Welch Tool Company, and he received a Northrop Patent Award check from Harold L. Fox of the Corporate Patent office.

At the urging of Corporate Licensing Administrator John Oliver, Mr. Yunt displayed the clamp at a recent Product Licensing show sponsored by the Los Angeles Chamber of Commerce.

The item prompted numerous inquiries and as a result, Welch Tool Sales, Inc. was selected to produce and market the clamp under license.

The clamp is easily attached to any type of drill press and, by simply pulling a lever, a craftsman can lock a piece of metal in place while drilling.

In what may turn out to be the second half of a profitable daily double for Mr. Yunt, Corporate Product Licensing is presently negotiating a license on a second invention.

This one is a rotary lathe cutting tool which slices titanium faster than existing lathes and doesn't burn up its blade as those now in use frequently do.

Because of the characteristic hardness of titanium, it is not uncommon for a blade to be rendered useless with only one cutting.

Professional 'Flight' Offered to Secretaries

A one-way "Ticket to Professionalism" is being proffered by Airborne Chapter National Secretaries Association, with an orientation "flight" September 1, at Hawthorne. They will enplane from the Crown Room entrance of the Cockatoo Restaurant, cocktails (5:30-6:30) with dinner in-flight. Destination — success, stability, and self-satisfaction.

Traveling companions will be members of the largest organization of women in one profession in the world. Membership in National Secretaries Association, International, now numbers 25,000 in the United States, Canada, Puerto Rico, and France.

Astrovision will feature a panel of experts who will deliniate the flight pattern and the guide service to be found in National Secretaries Association, on the road to professionalism.

Qualifications: travel light, bring a background of at least two years of secretarial experience, and be actively employed in secretarial work at this time. Accessories: a receptive mind, ambition, loyalty to your chosen field, willingness to broaden educational aims, and a bright smile as your I.D. badge. You might tuck in your boss' blessing. Most executives are acquainted with NSA, and are proud to have their secretary belong.

Ticketing the Airborne Secretaries professionalism flight at Northrop are Marianne Weltman, OS 5-4611, Ext. 1496 and Marge Stevens, CR 4-8061.

International Post Goes to Former AIA Executive

Jack T. Bradley, director of International Service of the Aerospace Industries Association, has been appointed a vice president of Northrop's International Division, Thomas V. Jones, president and chairman announced last week.

Mr. Bradley will make his headquarters at the Northrop Eastern District office in Washington, D.C.

Mr. Bradley has been director of International Service of AIA since his retirement from the United States Air Force with the rank of colonel at the end of 1962. He had a distinguished military career as a fighter pilot and wing commander during World War II and holds many high military honors and decorations, including the Distinguished Service Cross.

In 1955 he was named NATO advisor to the Royal Danish and Norwegian Air Forces. In 1959 he was named chief of the Aircraft and Missiles Division under the Deputy Chief of Staff, Operations, of the U.S. Air Force.

The following year he was assigned to the Far East Division, J-3, of the Joint Chiefs of Staff. In 1961, he was appointed deputy director for Military Assistance Planning in the Office of International Security Affairs of the Department of Defense.

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PIONEERS IN PARADYNAMICS: PART III

They're Looking Over a Three Leaf Clover

In early 1957 the Vince Riley family doctor advised the Northrop Norair structural design engineer that his son's health would improve if he moved to a drier climate.

So the Rileys packed up and moved over the hill to the San Fernando Valley, and Vince launched a new career with another Northrop Division — Ventura.

Vince went on to assist in conception of the steerable, Cloverleaf parachute which Northrop Ventura is presently developing. Vince and Gene Linhart are listed as co-inventors on the patent of this parachute.

The Cloverleaf design, however, was not the result of a split-second inspiration, which characterized so many concepts and discoveries of past eras.

"Inventions just don't come that way anymore," Mr. Riley said.

Three years of concentrated research based on a previous decade's collection of knowledge by Northrop Ventura paradynamicists preceded the present Cloverleaf configuration.

It all started with Ed Ewing's idea of a gliding parachute back in 1961. A modification of the Ringsail (invented by Mr. Ewing), became Northrop's first steerable parachute, and was appropriately dubbed "Glidesail."

An effort was undertaken to demonstrate that a large parachute could be made to glide under controlled conditions. NASA's Manned Spacecraft Center saw the potential of such an approach for manned spacecraft landings, and negotiated a contract to develop the concept further. Twenty-one separate configurations of three-foot diameter models were tested at the Norair wind tunnel. Eventually, the field was narrowed to three configurations for further experiments with 12-foot diameter models which were tested in wind tunnels at NASA's Ames Research Center, Moffet Field, California.

Ultimately, the Glidesail, equipped with flaps for obtaining glide and turn, achieved a glide ratio of 1:1. These tests led to a concept by T. W. Knacke of a single, circular canopy with the center pulled down to form a ridge on top. The concept, under NASA sponsorship, achieved a glide ratio of 1.4:1, and was designated the "Aerosail."

In 1963, the Air Force Flight Dynamic Laboratory at Wright Patterson AFB, awarded a contract to Northrop Ventura which allowed the research to continue.

Carl Graham, manager of the WADC Cloverleaf project, outlined the clear-cut requirements and objectives for a steerable parachute:

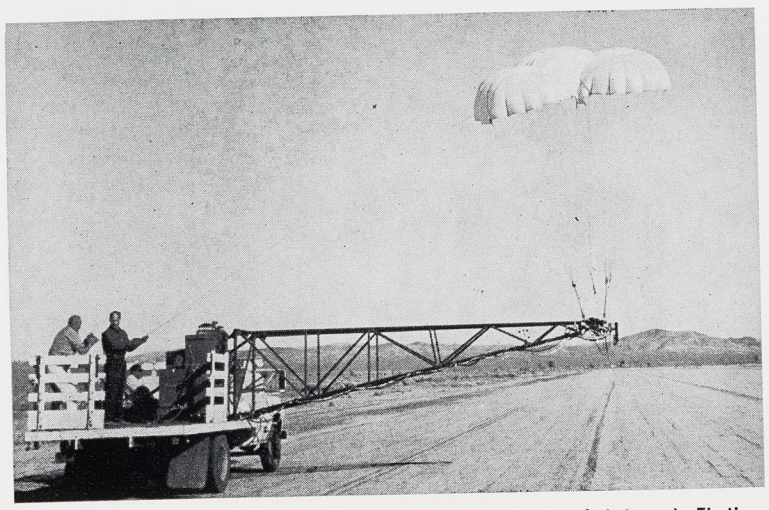
—A high glide ratio to allow the vehicle sufficient ability for horizontal flight during descent in order to reach a suitable landing area. A ratio of two feet of horizontal flight for every foot of descent has been the early goal at Northrop Ventura and has been achieved in wind tunnel and flight tests with the Cloverleaf.

—A high glide recovery to make it possible for the vehicle to steer into the wind.

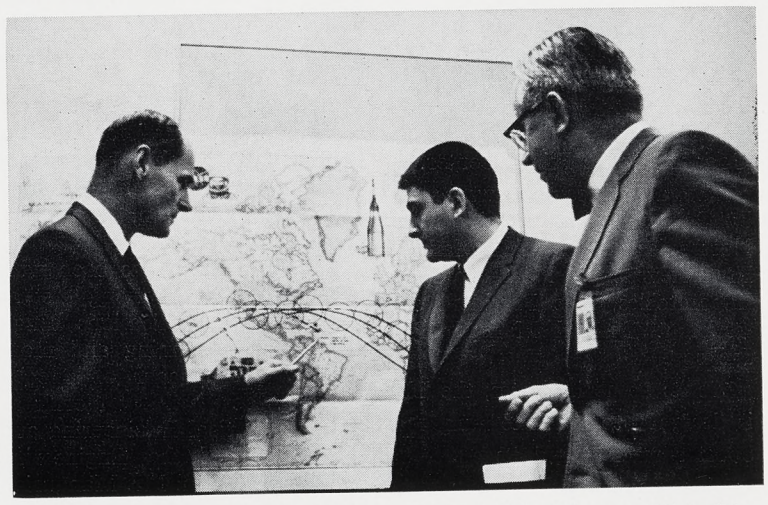
—A fast, logical and simple steering method which preferably would be similar to conventional aircraft.

—Low weight and volume of the total parachute system, an inherent requirement for all deceleration and descent devices.

(See PIONEER, page 5)

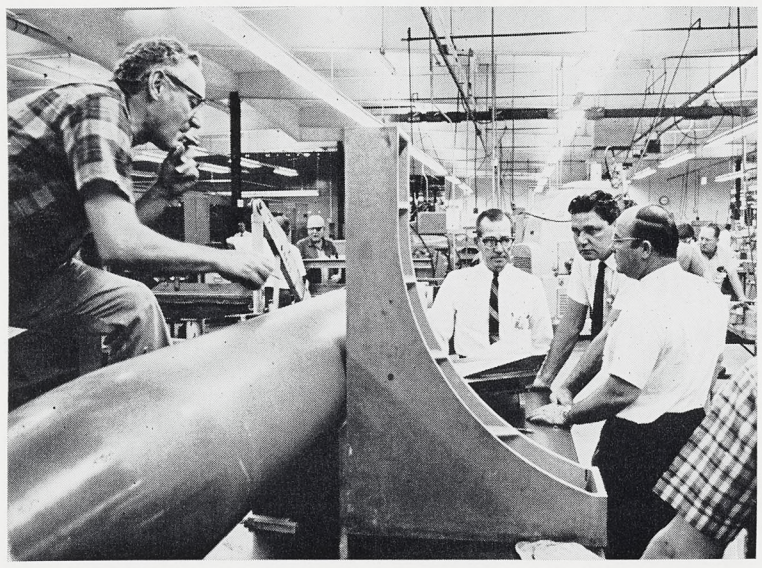


Vehicular tests of Cloverleaf parachute preceded trip to wind tunnel. That's Vince Riley making like Benjamin Franklin.

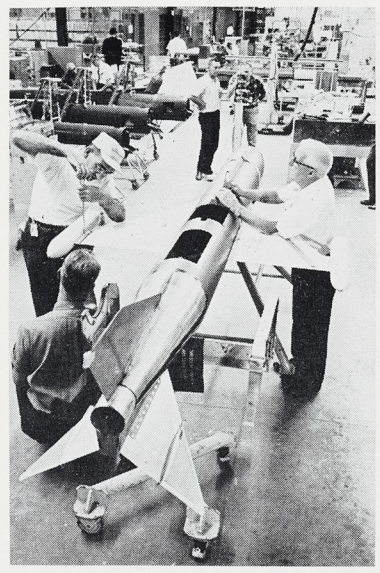


Mr. Riley (left), Gene Linhart, and Theo Knacke (right) study map which plots orbits of U.S. astronauts and a host of possible landing sites in Atlantic Ocean.

NORTHROP VENTURA PRODUCTION GROUP PREPARES ENGINEERING MODELS OF NEW TARGET DRONE



Sam Mannino (left), development mechanic at Northrop Ventura, keeps right on assembling NV-105 target drone while Jack Fisher (center), of engineering task force, and Earl Clark and Bob Bergman of Model Shop discuss design.



Transit is used to assure proper alignment of wind tunnel model which has since been through two-week aerodynamic checkout at Norair.

Wayne Wadington (left), lead aerodynamicist on project, discusses full-scale production strategy with Ralph Friesen, who is Manufacturing program manager for drone projects.-

Monty Cable, research technician, puts together inlet duct assembly, one of primary subjects of wind tunnel tests. NV-105 is slated for flight in October.

ACADEMY SELECTS DR. KELLER

Near Miss Is Still Honor for Nortronics Scientist

While Dr. Donald V. Keller of Northrop Nortronics' new Applied Research section at Newbury Park wasn't named one of the six scientist-astronauts recently announced by NASA, he came closer than 1984 other applicants.

According to Dr. Keller, the original list of 2000 applicants was trimmed to 400 by NASA. The National Academy of Sciences was asked to make nominations from the list of 400 scientists.

Dr. Keller was one of 16 finalists selected by the National Academy of Sciences for the program.

As one of the 16 finalists, he spent two weeks at NASA's Manned Spacecraft Center, Houston, for intensive interviews and medical examinations.

A physicist, Dr. Keller heads a 11-man laser and shock research team (NORTHROP NEWS, May 19, 1965) which recently developed a technique for controlling both frequency and intensity of ruby laser beams.

In a letter to Dr. Donald A. Hicks, vice president and manager of the Applied Research group, the assistant director for flight crew operations at NASA, Donald K. Slayton, said:

"It is our opinion that the fact that he (Dr. Keller) reached the final level of competition and was nominated by the National Academy of Sciences is in itself a considerable honor."

(Deke Slayton himself was selected as one of the original Mercury astronauts, but later was denied a flight in space because of a minor physiological defect.)

Out of curiosity, the NORTHROP NEWS asked Dr. Keller why he wanted to go to the moon.

"It was an unusual opportunity," he said, "combining the features of personal and technical challenges. I think that some of the same characteristics that motivate a man to be a scientist would motivate him to accept the challenges of personally investigating outer space."

Dr. Keller's family was a little hesitant at first about his application but during the long weeks that NASA and the Academy were screening candidates, they got used to the idea.

"Toward the end they became just as anxious as I was," he said.

WINS PATENT

Roy Perschy (left) is inducted into Northrop Honor Roll of Inventors by Northrop Nortronics vice president Ross Miller. Mr. Perschy invented a plotting slide for Vigicon data display system.

F-5 SPANS OCEAN FOR FIRST TIME ON MONTH-LONG EUROPEAN TOUR

Northrop's leased F-5B (N8008) was back on the United States demonstration circuit again this month following an eventful month-long European excursion.

Along the way the F-5B became the first F-5 to carry out an ocean-spanning hop, taking the aerial route over the Atlantic Ocean both to and from Europe. Between these flights the F-5B was viewed by thousands of people at two international air shows, performed solo demonstration flights, and carried out extensive evaluation missions involving European pilots.

John Fritz, Northrop Norair chief of Flight Programs, OPINDOC, piloted the eastward Atlantic crossing, while Casey Finnegan, OPINDOC pilot, flew the westward leg. T. M. Shackelford, a Norair crew member, was observer on both flights.

On both Atlantic crossings the F-5B traveled in company with the famed U.S. Navy Blue Angels.

Stops along the Atlantic route were made at Loring AFB, Maine; Goose AB, Labrador; Sondrestrom AB, Greenland; Keflavik Naval Air Station, Iceland; and Prestwick Airfield, Scotland.

On the European continent the F-5B operated from Evreux-Fauville AB and Le Bourget Airport in France; Gosselies and Brustem, Belgium; and Eidenhoven, The Netherlands.

The F-5B performed demonstration flights at the Paris Air Show and was also placed on static display at the Belgium Air Show.

Murray Makes Plans For Rangers Reunion

Colonel Roy Murray, jr. of the Northrop Ventura Customer Relations staff has been named chairman of the arrangements and programs committee for the biennial reunion of the Ranger Battalions Association in Santa Barbara next month.

The association is comprised of veterans of the six commando units that spearheaded every major invasion during World War II. Colonel Murray, former commander of the Fourth Ranger Battalion, is secretary of the national executive committee.

NEW ASTRONAUT SEES T-38, HL-10

Dr. Edward G. Gibson, a scientist-astronaut-elect, was a special visitor at Northrop Norair last week where he viewed two Northrop products of special interest to his future.

Dr. Gibson, a physicist, is one of six scientists recently selected by National Aeronautics and Space Administration (NASA) for special training as scientist-astronauts (Northrop NEWS, July 14).

One of Dr. Gibson's first assignments in his new career is a 53-week training program at Williams AFB, Arizona, to become a qualified pilot.

DRULINER ASSIGNED TO METROLOGY POST

C. J. Druliner, a veteran of almost 25 years in Northrop Quality Control activities, has been named Nortronics general supervisor of the Metrology branch by Frank W. Lynch, vice president and manager—Operations.

Mr. Druliner will be located at the Anaheim facility and reports to F. W. McNabb, director of Quality Assurance.

Beginning his Northrop career in December 1940, Mr. Druliner has worked in a wide variety of quality activities. He was chief inspector at Northrop Space Laboratories before transferring to Nortronics' Precision Products Department where he has served as superintendent of Acceptance Control for the past 18 months.

Mangurian Moves to MED; Heads Simulator Program

G. N. Mangurian has been assigned as program manager on the world's first Launch Phase Simulator (LPS), presently under development by Nortronics Marine Equipment Department for Goddard Space Flight Center.

The announcement was made by Corporate Vice President and Nortronics General Manager Fred Stevens and Northrop Space Laboratories Vice President and Assistant General Manager Roy Jackson.

As its name indicates, the LPS is designed to simulate launch of booster rockets and its effect on satellite payloads.

The LPS will subject spacecraft simultaneously to varying loads of vibration, acceleration and acoustics. At the same time, air pressure will be decreased to simulate altitude.

According to NASA, which operates the Goddard facility, the LPS will test such spacecraft as space observatory, meteorological, communication, and geophysical satellites.

Mr. Mangurian has been with NSL since 1963, serving first as manager of Applications Engineering and Planning and more recently as manager of Special Projects. He served at Norair as chief, Analytical Engineering and as director of the Engineering Technical section. Mr. Mangurian holds both bachelor and master degrees in civil engineering from MIT.

Visitors to Northrop Architectural Systems "Flying Showcase" leave chartered plane at Fort Worth, Texas, after seeing latest developments in architectural products. Trip covered 18 metropolitan areas, where more than 250 dealers and distributors went aboard.

Flying Showcase Boosts Orders for NAS Products

A "flying showcase" of Northrop Architectural Systems' products has completed visits to 18 eastern and midwestern cities served by the wholly-owned subsidiary's new manufacturing facility at Murphysboro, Illinois.

The sales promotion idea has resulted in a marked increase in orders and a growing interest in NAS products, according to Paul Leslie, director of Sales and Marketing.

More than 250 dealers and distributors went aboard the specially-equipped airplane, which contained displays of Arcadia sliding glass doors, storefronts, window walls, and other Arcadia products.

Production got under way in May at Murphysboro in a move toward a larger share of the architectural building products market in the east and midwest.

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills.

Classified

Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Bicycle, boy's 26", $10. Inglewood, PL 6-7681. A

Datsun Fairlady, 1965, r/h, new tires, $1650. Torrance, DA 6-7480. A

Rambler American, 1959, 2-dr., r/h, auto. trans., $325. Lawndale, 371-9861. A

Tools, Starrett, small hole gages, 1" micrometer, 2" micrometer, depth gages, calipers, sell sep. or $45. Inglewood, OS 6-0049. A

Aquarium, 10 gal. w/stand, pump, heater, $10. P.V. Pen., 377-5724. A

Headboard, $3.95. Gardena, 329-9486. A

Range, Kenmore, about 8-yrs.-old, $15. Manhattan Bch., 379-6762. A

Encyclopaedia Americana, 1963 edition, incl. 2-vol. set Funk & Wagnall's dictionary, $200. Hawthorne, 676-5884. A

O'Keefe & Merritt Comb., 1965 model, to be built in, $250. Lawndale, 676-3050. A

Stove, dble. oven, Estate, $10. Torrance, DA 6-5004. A

Austin Healey, 1956, 4-cyl., $500. Inglewood, 672-5798. A

Lot, large, in Palos Verdes Estates, terms, $20,500. P.V. Ests., FR 5-0867. A

Chevrolet, 1958, new tires, RCA record player, $700. Hawthorne, OS 6-0264. A

Boat, 20' Owens w/75 hp Evinrude, twin 20-gal. fuel tanks, sleeps 4, $2300. P.V., 377-8259. A

Dinette Set, chrome finish, 4 chairs & table $40. Manhattan Bch., FR 2-6916. A

Engagement & Wedding Ring Set, ⅛-k centercut, 10 smaller diamonds, $150. So. Gate, LO 7-9983. A

Ski Boat, 16' Glastron, 70 hp Mercury eng., used less than 10 hrs, elec. start., Walstrom trailer, $1550. Long Bch., 244-5987. A

Drafting Machine, K & E Paragon w/24" arm, $50. Anaheim, PR 4-3152. A

Golf Clubs, glass-shaft, D-4 wt., 8 irons, 1 pitching wedge, 1 putter, 3 woods, bag & cart, $125. Gardena, DA 3-3202. A

Outboard Motor, 40 hp Mercury, elec. starter, 6-gal. gas tank, $265. Hawthorne, OS 6-5219. A

Fire Alarm Sys., 8 units, Emdeco, $50. Garden Gr., 714-539-2262. A

Volkswagen, 1963, sun roof, radio, w/s/w, $1250. Hollywood, 656-3475. A

Wedding Dress w/veil, silk organza, size 10, $80. Inglewood, 672-5903. A

Tires, 2, Goodrich tubeless w/s, 7.50 x 14, $20. Hawthorne, OS 9-4387. A

Kitten, Siamese, 7-wks.-old, female, frost-point, $20. Buena Pk., 714-521-0416. A

Schnauzer, min., male, 9-mos.-old, AKC reg., $100. Anaheim, 714-776-8956. A

Saxophone, alto, gold finish, Buescher, new pads, $150. Santa Monica, GL 4-7770. A

Trailer, 1964 Lo Liner, 13½', complete w/8' x 8' enc. canopy, used less than 5000 miles, $1050. Lakewood, HA 5-6844. A

Apt., 4 units, in San Pedro, P.V. area, $45,000. Inglewood, OR 7-8797. A

T-Bird, 1962, r/h, w/s/w, full power, $2200. Inglewood, 677-0743. A

Camping Equipment, 3-burner, Coleman stove, 2-mantle lantern, ice chest, $35. Los Alamitos, GE 1-4233. A

De Soto, 1957, Firedome 2-dr. h/top, full power, $225. Hermosa Bch., 376-5131. A

Buick, 1954, Special conv., $250. Canoga Pk., 341-3525. A

Cooler, room-size evaporative-type, used once, $62.50. P.V. Pen., 377-3806. A

House, 3-bdrm., 2 baths, built-ins, fireplace, pvt. patio, dble. gar., near schools, & beaches, $32,500. Torrance, FR 8-1350. A

Typewriter, Remington Rand, portable w/case. 15-yrs.-old, $35. Redondo Bch., 378-3981. A

Chevrolet station wagon, 1960, Parkwood, V-8 eng., p/s, $895. Inglewood, OR 4-6096.

Sailboat, 14' Omega calss, fiberglass w/mahogany trim, w/custom trailer & all equip., $800. Redondo, 379-7567. A

GTO, 1965, h/top, 4-spd., 9000 miles, $2850. Playa del Rey, EX 1-8072. A

Window, 4, 3' x 5' louvered, alum., $40. Manhattan Bch., 376-4787. A

Tape Recorder, new tape speed of 15/16, plus 1⅞, portable, battery or AC operated, auto & AC adaptors, other access., $87.50. Box 1301. A

Volkswagen, 1963, headrest, s/b, $1250. Hermosa Bch., 379-8832. A

House, 4-bdrm., 2-bath, large fenced backyard, $450 down, $17,550. Gardena, DA 9-6297. A

Austin Healey, Sprite, 1959, r/h, $600. Lawndale, 370-6472. A

Movie Camera, K56-Keystone 16mm, mag. load, 1.9 lens & 75mm 3 in. tele. lens, K-161 16mm Keystone projector, $199. Thousand Oaks, 805-495-3449. A

Surfboard, Jacobs, 8'11", or 1' redwood stringer, $70. Inglewood, OR 0-3713. A

Television Set, Packard Bell, 21", maple cabinet, $65. Torrance, DA 9-3721. A

House, 3-bdrm., 1¾ bath, 1750 sq. ft. w/patio, 2-car attached gar., fireplace, fully landscaped, fenced yd., near schools & Harbor & Santa Monica Fwys., $2000 dn., $26,500. Torrance, TE 4-9420. A

Stereo, custom-made, 8' long, black walnut, 2-12" Stevens full-range speakers, AM-FM & MX. 70-watt EICO int. amp. & Gerrard type A changer, $600. Gardena, 327-2727. A

For Sale

Glass boat, 1960 model, 12' w/7½ hp motor, on trailer, $350. Hawthorne, OS 5-3866. A

Cadillac, 1958, sedan De Ville, $750. Hawthorne, 676-8738. A

Shaver, elec., Schick 10-66, 3-spds., adjustable heads, $8. Torrance, 371-9651. A

Mini-Bike, big frame, 5½ h.p., West Bend, $140. Santa Monica, 391-1471. A

Trailer, Fleetwood, 1957, 2-yrs.-old, my equity of $2000 & take over pymts., bal. approx. $3600. Gardena, 329-7998. A

Air Conditioner, fits 1964 Falcon V-8, never installed, $150. Inglewood, OR 2-2370. A

VW sedan, 1960, new paint, radio, rear speaker, w/s/w, $850. L.A., 755-4396. A

Furniture, Early American, living, dining, bed rooms & kitchen, sell sep. or $1000. P.V. Ests., FR 5-8625. A

Boat, Glasspar Delmar, American tilt trailer, complete, $1295. Gardena, 635-3127. A

Range, $10. Hawthorne, 675-9389. A

Kittens, Siamese, seals & blues, $25 w/pedigree, $20 w/out papers. Hawthorne, OS 5-9789. A

Chevrolet, Biscayne, 1959, 47,000 miles, 1-owner, $425. Hollydale, ME 3-2395. A

Volkswagen, 1963, sunroof, $1250. Long Bch., 596-1280. A

Hillman Husky, 1962, 17,390 act. miles, $550. Anaheim, KE 2-3103. A

Executive Home, 2400 sq. ft., heated pool, view lot, $45,000. Thousand Oaks, 495-9984.

House, 2-bdrm., lge. living room, h/wood floors, fenced yd., $20,500. Redondo, FR 8-2609. A

Trailer, 4' x 6' box, new tires, $50. Inglewood, PL 5-4497. A

Range, O'Keefe & Merritt, 4-top burners, grill, broiler & oven, auto. timer, $65. Gardena, 675-1005. A

T-Bird, 1955, h/top, full power, many new access., $975. L.A., 645-7591. A

Executive Desk, w/swivel chair & side chair, $60. Torrance, DA 9-2403. A

Porsche 1600 super coupe, 1957, Bursch exhaust, Koni shocks, h/rest, $1350. Redondo Bch., FR 5-6773. A

Falcon, 1961, 4-dr., deluxe wagon, luggage rack, $875. La Mirada, 714-LA 1-9965. A

MG-TF, 1955 Classic, low act. miles, wire wheels, new top, $675. Manhattan Bch., FR 2-0540. A

Chevrolet, 1957, 210 stick, V-8, r/h, new tires, $399. Long Bch., 596-2039. A

Player Piano, elec., rolls & cabinet incl., Muzette, $900. Inglewood. OS 6-1070. A

Massage, Niagara, Cyclo, heat & massage pad, complete, carrying case, $200. Lakewood, 425-1638. A

Baby Bottle sterilizer, Evenflo elec., $5. Torrance, 371-8939. A

Chair, blue, contemporary, $45. Rolling Hills Ests., FR 8-2190. A

Fiat, 1960, 1200 series, good tires, $300. Torrance, FR 5-9946. A

Volvo, 1961, racing cam, tach., 4-spd., r/h, b/s, $795. Anaheim, KE 5-6296. A

Mustang, 1965, stick shift, r/h, 12,500 miles, 1 owner, $2050. Hawthorne, OS 6-2597. A

Monza, 2-dr., 4-spd., 1964, r/h, all extras, b/s, 1 owner, $1475. P.V. Ests., FR 7-1478.

Chevrolet Impala SS, 1964, p/b, p/s, r/h, fac. air cond., $2950. Ontario, 714-984-4660.

Ski Boat, 15'8", Classic (trophy model), 1964, 85 hp Mercury outbd., mech. steering, many extras, $1695. La Mirada, 714-521-9798. A

Buick Special, 1962, V-6, beige, $1200. Hawthorne, 677-4271. A

End Table, set, Heritage contemporary, $60. L.A., FR 8-2190. A

Bedroom Set, 5-pc., maple, $75. 754-4384. A

Wanted to Buy

Boat, 12' or 14' alum., with or w/out motor. San Pedro, 831-5304. B

Chevrolet, late model or GMC station wagon on truck chassis. Hawthorne, OS 6-8331. B

Table, redwood, 6', pay up to $10. Torrance, FA 8-3306. B

Camera, single lens reflex 35mm, desire built-in meter. Torrance, FA 8-0460. B

Motor, 4-cyl. or equivalent for 1960 Singer Gazelle or Hillman. Inglewood, OR 7-7355. B

Rentals Offered

Apt., 2-bdrm., 1½ bath, unfurn., lge. closets, child OK, 2 blocks to Norair, $115 mo. Hawthorne, 679-0622. E

House, 2-bdrm., avail. about Sept. 4, water pd., $125 mo. Hawthorne, OS 5-6206. E

Duplex, 3-bdrm., on the beach, garage, patio, $160 mo. Hawthorne, 679-5506. E

Apt., single & 1-bdrm., redecorated, furn., utilities pd., pool & rec. fac., from $92.50. Torrance, 329-9276. E

Cabin, A-frame, at Big Bear Lake, Moonridge area, sleeps 6 adults or 4 adults w/children, 1 block from golf course, swimming pool & riding stables, $30 weekend; $80 wk. Palos Verdes, FR 7-3888. E

Apt., 1 & 2-bdrm., 10 mins. from Nortronics PV, furn. & unfurn., $75-$125. Torrance, FR 5-2091, 375-9397. E

Apt., 2 & 3-bdrm., children & pets OK, 2 baths, all elec., from $135. Torrance, 370-4747. E

Rentals Offered

Apt., on Bass Lake near Yosemite, pvt. entrance, deck, dock & boat mooring, sleeps 7, ½ mile from main village, $100 wk. for 2, $125 wk. for up to 7 persons, Rolling Hills, 377-2101. E

Apt., 1-bdrm., unfurn., triplex, 1-level, lge. rooms, pvt. patio, carport, laundry rm., adults, $78.50. Gardena, DA 9-9195. E

Apt., 2-bdrm., deluxe, lower, washing fac., walking distance to Northrop & shopping, sundeck, $115. Hawthorne, OS 6-2948. E

Apt., 2-bdrm., modern, deluxe, garage, $98. Hawthorne, 675-1782. E

Apt., 2-bdrm., deluxe, pvt. garage, laundry rm., walk to Northrop, $110 mo. Hawthorne, OS 5-3792. E

Apt., 1-bdrm., utilities paid, washer, dryer, & pool, 1½ miles from Northrop, unfurn. $100; furn. $120. Hawthorne, OS 9-7123. E

Apt., 1-bdrm., deluxe, pool, $95 mo. Redondo Bch., 376-2117. E

Vacation Cabin, Green Valley Lake, $55 wk. Torrance, 320-2002. E

House, 2-bdrm., large fenced yard, newly decorated, water & trash paid, $115. Hawthorne, 675-3725. E

Apt., 2-bdrm., walking distance to Northrop, 2 bath, large exec-type, closed gar., $130. Hawthorne, 676-9620. E

House, 2-bdrm., unfurn., rear, stucco, garb. disp., gar., water, lawn & trash serv. incl., 2 children OK, no pets, close to Northrop. $107 mo. Lawndale, OS 6-8768. E

Beach Apt., sleep 6 & 10, Balboa, $125 & $200 wk. Inglewood, 672-3764. E

Apt., 2-bdrm., near transp., schools, $95. No. Long Bch., GA 2-0544. E

Studio Apt., 2-bdrm., 2½ baths, deck, subterranean gar., adults, near San Diego Fwy., lease, $175. Inglewood, 373-1143. E

Personals

Flying Bonanza to Ohio Sept. 3-13. Need 2 passengers to share expenses, $130 ea., round trip. Playa del Rey, 397-6326. L

Ironing in my home, 2 blks. from Norair, $1 hr. Hawthorne, 675-6291. L

Working girl wanted to share home w/same, 1 child OK. Anaheim, PR 2-1908. L

I Wish to extend my deepest appreciation for the thoughtfulness, phone calls, & many get well wishes sent during my recent illness. J. W. (WES) SMITH & FAMILY L

Young woman, 23-27 to share 3-bdrm., 2-bath home, pvt. room & bath if desired. $70. Newbury Pk., 805-498-2879. L

House, 2-bdrm. & den, share w/1 person, $65 mo. Lawndale, 772-5027. L

Share 3-bdrm. house, furn. w/2-3 other men, 5 mins. from Norair & Johnson facilities, incls. utilities, $50 single, $35 ea. double. Hawthorne, 676-0418. L

Share 3-bdrm. apt. w/3-4 men, furn., on beach, $185 mo., Playa del Rey, 391-8349.

For Sale or Trade

M-1 Carbine, 30 cal., $65 or trade for pistol or Winchester carbine. Manhattan Bch., 372-3878. M

T-Bird, 1957, full power, a/c, h/top w/portholes, Firestone premium tires, $1425 or part trade for Continental or Mark II Lincoln. P.V., 377-6222. M

House, 3-bdrm., 1½ baths, red. interior, cooler, garb. disp., fenced yard, in Palmdale, $12,500 or trade for home in South Bay area or Orange County. Box 1302. M

Piano, consolette, walnut, $295 or trade for bicycle, motorcycle, tools. Hawthorne, OS 6-5253. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

8 a.m. — 4:45 p.m.

Hawthorne & Lennox Blvd., Hawthorne. Bonnie Condon, Norair, ext. 617, 375-3744. 5

Victory & Platt Ave., Canoga Park. Will consider car pool. Donald C. Gill, Norair, ext. 1829, DI 7-3193. 5

Sepulveda & Devonshire, Granada Hills. Bob Rothstein, Norair, ext. 650, 360-1377. 5

Shoup & Victory, Canoga Park. Melvin D. Sadowsky, Norair, ext. 1752, 348-8588. 5

Sunset Blvd. & La Cienega Blvd., W. Hollywood. Kurt H. Meissner, Norair, ext. 4270, OL 4-1842. 5

3:45 p.m. to 12:15 a.m.

Chapman & Alameda, Orange. Larry Slininger, Norair, ext. 2408. 6

Rides Offered

7:30 a.m. — 4:15 p.m.

Ball & Crescent, Buena Park, 1 or 2 passengers. D. H. Eaglin, Norair, ext. 2655, TA 8-2857. 13

8 a.m. — 4:45 p.m.

Sepulveda & Devonshire, Granada Hills. Bob Rothstein, Norair, ext. 650, 360-1377. 15

Shoup & Victory, Canoga Park. Melvin D. Sadowsky, Norair, ext. 1752, 348-8588. 15

Sunset Blvd. & La Cienega Blvd., W. Hollywood. Kurt H. Meissner, Norair, ext. 4270, OL 4-1842. 15

Crenshaw & Wilshire Blvd., Los Angeles. C. M. Spindel, Norair, ext. 2522, 465-8023.

3:45 p.m. to 12:15 a.m.

Chapman & Alameda, Orange. Larry Slininger, Norair, ext. 2408. 16

Palmdale Hosts Ladies Gathering

Approximately 45 of Northrop's fairest, including 25 from the Los Angeles area, gathered in Palmdale late last month in what has become an annual get-together for Northrop women.

Antelope Valley fems planned the affair which included an around-the-pool motif with a buffet, a unique fashion show, and a tour of the Palmdale facility with Superintendent Al Graber acting as guide.

Previously, similar events have been held in Northrop Ventura and Northrop Hawthorne complex areas.

FIRE SAFETY

Northrop Norair's Safety and Fire Prevention branch recently completed installation of a new safety device on cigarette cans shown. Wire cover, spotwelded in place, prevents loss of covers formerly used, discourages dropping paper and other waste in cans. Minor fires resulted in past when cigarettes and matches ignited waste in cans.

HIGHER DISABILITY TAXES IN EFFECT

Northrop California employees will note that larger amounts are being withheld from their paychecks to cover California State Disability Insurance.

California's State Legislature recently voted to increase the applicable tax rate from 1.0 percent to 1.1 percent for the remainder of 1965 and to boost the taxable income limit from $5600 to $7400.

Northrop Payroll organizations will use the new rate in computing deductions (under SDI paycheck stub heading) effective August 1. Those employees whose income had already exceeded $5600 exempting them from further deductions this year under the old law are also affected.

On January 1, 1966, the rate reverts to 1.0 percent, but the taxable limit will remain at $7400.

Stamp Club to Meet

Northrop Stamp Club members gather at NRC Clubhouse in Hawthorne August 16 for a regular meeting beginning at 7:15 p.m.

Plans call for a speaker, display, a swap meet and door and attendance prizes.

PIONEER: Three-in-one Parachute

(Continued from page 3)

—Low impact velocity.

When Northrop took on the assignment in 1961, Vince had less than a year's experience in parachute recovery systems. Most of his first four years on his new job had been devoted to airframe design for target drones.

When assigned as project engineer on the steerable parachute program, he soon found himself back in familiar territory, however. He began conducting tests on parachute configurations at the Norair wind tunnel, a place he had frequented for more than four years while assigned to the X-21 laminar flow control aircraft program from 1953-1957.

By this time Gene Linhart had joined the Northrop team after earning his master's degree in aerodynamics at the University of Minnesota, and Vince had absorbed about all that was known about gliding parachutes at the time.

Through the remainder of 1963 and into the early months of 1964 the work continued.

Vince was testing the different configurations, and Gene was responsible for aerodynamic analysis of their performance.

"If we had been designing an airplane, it would have been a lot easier," the men said. "We would have had numerous references and the results of previous experience to begin with.

"As it was, all we had to work with was our own experience in a field that was new to the entire industry."

But in less than a year the newest configuration had achieved a glide ratio of 2.1:1.

This was the Cloverleaf, a cluster of three parachutes stitched together to form a single canopy. In addition to the new configuration, the Cloverleaf uses a low porosity material that differs considerably from materials used presently in Gemini and Apollo recovery systems.

Another major contribution to the Cloverleaf's high glide ratio is its pointed leading edge as opposed to blunt-edged conventional chutes, Mr. Riley said.

Controlled landing of space vehicles is only one potential application of the Cloverleaf, Vince and Gene point out.

Recovery of booster rockets on land and undamaged could save the U.S. millions of dollars annually.

Pinpoint landing of supplies from aircraft in limited warfare environments is an area of exceptional potential for the Cloverleaf, the men said.

Also, high altitude instrument systems could be steered toward a ground beacon.

Since the steerable parachute is still in the research phase, its impact on defense and space programs cannot be fully determined.

But the pioneering chapter in its history can be written, and it introduces into the over-all history of paradynamics a couple of guys named Riley and Linhart.

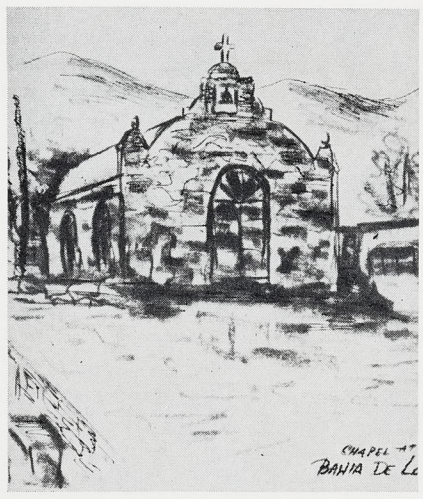
Contract Auditors Consolidated Into Single DOD Agency

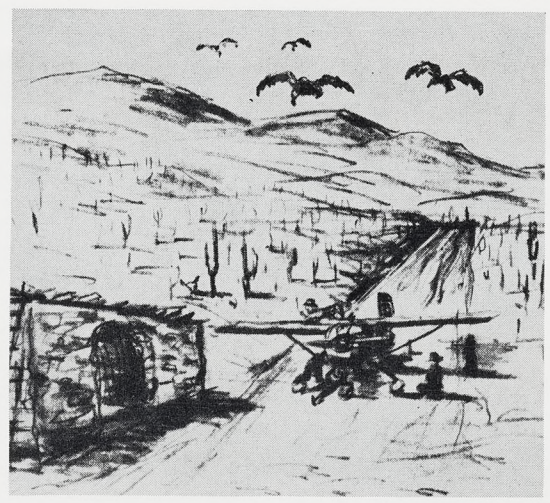
Contract audit activities of three military department audit agencies have been consolidated into a single agency under the authority, direction and control of the Secretary of Defense.

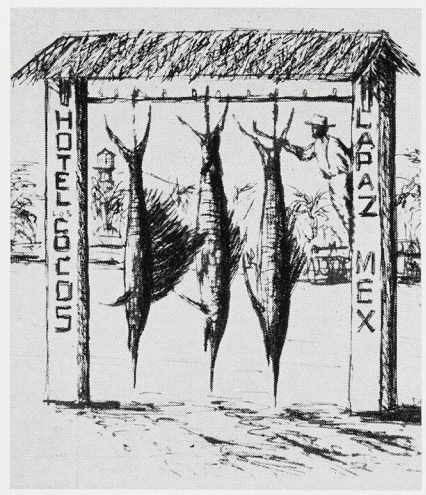
Called the Defense Contract Audit Agency, the independent agency is now responsible for performing all contract audit services within the Department of Defense and other government agencies concerned.

Henry A. Wallace has been named regional manager of the Los Angeles Region of the new agency. Mr. Wallace announced that Miss Eunice E. Stockman, with offices in Hawthorne, will continue as the resident auditor for the company. In addition, John Nosk, with offices in Newbury Park, continues as supervisory auditor for Northrop Ventura and the Applied Research department of Northrop Nortronics.

The consolidation will bring about uniformity in the administration and performance of contract audit activities which will be of material benefit to defense contractors.







Story of fishing trip to Baja California was recorded in charcoal by Northrop Ventura's Doug Finch. Scenes (left to right) include chapel at Bahia de Los Angeles, isolated Mexican farm where group made emergency landing for repairs, and three prizes from the Gulf of California—two marlin and a sailfish. Mr. Finch and fishing partner Bill Briggs also recorded trip on film, which they shared with other Venturans recently in Division auditorium.

ABOUT BAJA ADVENTURES

Venturans Spin Interesting Yarns

Two members of the Northrop Ventura Rod and Gun Club returned last month from a 2000 mile fishing trip deep into Baja California, but most of the stories they tell about their week-long adventures have nothing to do with fish.

Bill Briggs of Business Systems and Doug Finch of Graphic services joined two other adventurers from the Los Angeles area in the round trip flight to La Paz, where they landed marlin and sailfish in the 150-pound class and red snapper and other smaller fish in the 20-pound class.

Flying a private Cessna 182, four-place craft, the quartet was more impressed with the friendliness and kindness shown by Mexican families in remote areas of the Baja peninsula than with the sport fishing.

On the outbound leg of their trip, the men said, the plane's fuel gauge suddenly dropped to zero about 70 miles from the nearest landing strip.

Pilot Jim Liles, an employee of MGM, set the Cessna down in a remote field. They discovered the problem was in the gauge rather than a fuel shortage, but the plane had suffered minor damage in the landing.

There was a small farm in the area, and a Mexican family came out to help with the repairs.

"They appeared to be extremely poor," Doug said, "but they offered us everything we needed. When we tried to pay for their services, they refused to take anything."

On most of their other refueling stops, the group managed to do a little sightseeing on the ground, including Bahia de Palmas, Mulege, El Barill, Bahia de Los Angeles and the Santa Maria Sky Ranch.

"At one place we noticed a hotel under construction and stopped to chat with some of the workmen," Bill related. "We discovered they were convicts who came down to the town to work during the day. The money they earned went to support their families."

At La Paz, they chartered a cruiser and spent three days fishing in the Gulf of California.

Each of the four took movies which they combined and edited after returning to Los Angeles. The 35-minute documentary was shown last month to Division employees.

ANDREWS: The Masked Marvel Returns as Gentleman Farmer

(Continued from page 1)

than 5000 drones the crew put back in shape, Northrop brought back to the Los Angeles area one of the best collections of fixer-uppers in history.

Now supervisor of drones and F-5/T-38 seat assembly at Newbury Park, Andy and his family weren't the least bit upset about leaving El Paso although "we still have fond remembrances of our 8½ years there.

"The kids like the schools, we all like the Conejo Valley, and I've become something of a gentleman farmer," he says.

Last year's bean crop turned out so well, Andy gave corn a try this year, and it's about shoulder high at present.

So we asked Andy the same question of all reporters at this point. What was the most unforgettable moment at El Paso?

"There are two instances I'll never forget," he answered. "After a steady diet of propellor-driven OQ-19's, the Army was about to get its first shot at the supersonic RP-76. The young man on radar who was keeping the tracking station informed was also on a loudspeaker.

"Suddenly, his voice went up about two octaves as the target made its first blip on his screen. 'This ain't no OQ-19; this thing's movin'," he shouted.

Andy's other favorite story is about an Army officer with a big, red handle-bar mustache. He took one look at the RP-76 and made a public offer that if any of the missile units ever made a perfect score against it, he would cut off his mustache and let them mount it.

"Well, it wasn't long," Andy relates, "before a unit did make a perfect score. And, needless to say, one of that unit's prized trophies is a gold-plated handlebar mustache mounted on a plaque."

Don't Overload

A good rule to remember on your summer vacation motor trip is "don't overload your car." Overloading, the Greater Los Angeles Chapter of the National Safety Council says, tends to put most of the weight on the rear wheels, with the result front wheels float and steering effectiveness is seriously reduced.

Circle R Ranch Site of Two-Day Golf Tournament

Northrop Ventura golfers will tee off September 26 at Circle R Ranch near Escondido in their biggest event of the year—a 36-hole, two-day tournament sponsored annually by the NVRC Golf Club.

Reservations for the weekend outing are presently being accepted, according to Commissioner Ron Morin.

The upcoming tournament is the only 36-hole competition of the year, although the Golf Club sponsors 11 other 18-hole matches at numerous Los Angeles area courses throughout the year.

This month's match is scheduled August 28 at Whispering Lakes.

"We now have more than 300 members, "Mr. Morin said, "and schedule four flights at each match, including one exclusively for women."

Extra prizes will be awarded, however, for the two-day tournament next month, the commissioner said.

First Obstacle Cleared for NRC Ham Net

Preliminary efforts in the establishment of an all-Northrop amateur radio network have been highly successful, although it appears the next step may be more difficult to take.

This was the comment of Paul Staudenmayer, NRC Radio Club commissioner at Nortronics (Anaheim) who has led organizational efforts to date.

"We asked for names, call letters and addresses of all Northrop amateurs who would like to take part. We received more than 84, with people located almost around the world," Mr. Staudenmayer said. "These names have been incorporated into a master list and copies sent to all who contacted us."

Several members of Northrop Ventura Radio Club have responded to the Nortronics idea.

Next step, Mr. Staudenmayer said, was to work out a suitable operating mode, time and frequency acceptable to all. This will be the master step.

Until sufficient opinions can be obtained, the amateurs are going on the air each Sunday at 1701 PDST or 2001 EDST.

Plans call for the use of the following frequencies: 146.02 mc phone; 50.304 mc phone; 21.413 mc phone; 14.313 mc phone; 7.210 mc phone; 14093 cw; or 7110 cw.

There will be no net control. Stations will simply call "CQ. NRC" in an attempt to contact other members.

Following initial contacts and further suggestions, some sort of more definite arrangement will be worked out, Mr. Staudenmayer said.

UNDISTURBED, EXCEPT BY AN OCCASIONAL STRAY SHEEP, NVRC GOLFERS RELAX AT NOON ON PRIVATE DRIVING RANGE

"No, no, you use both hands," Joe Cosgrove (left) shouts at Lillian Goodwin during practice at NVRC driving range. Lois Burmahln (center), one of top women golfers in NVRC monthly tournaments, is undisturbed by commotion.

"Now that's the ball," Joe says to barefoot Lil. He is treasurer as well as "resident pro," and she is secretary of club.

Lil appears to have gotten the swing of it, or maybe she's just showing off for Ron Morin (far left), Golf Club commissioner. Fred Longo is vice commissioner. Lois Burmahln just keeps on swinging—and winning.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 14 | August 25, 1965

WAGE PACKAGE INCLUDES MORE FRINGE BENEFITS

A wage and benefit package which includes salary increases from 9 to 13 cents an hour for technical, office and factory employees at Northrop Ventura was announced August 9 by George Douglas, Corporate vice president and general manager.

The announcement was made following acceptance of the increases by the Organization of Northrop Employees (ONE).

While improved fringe benefits was not a subject of discussion during the negotiations with the employees' bargaining unit, Mr. Douglas said that revisions made in some benefits for salaried personnel, announced May 21, would be extended to hourly personnel.

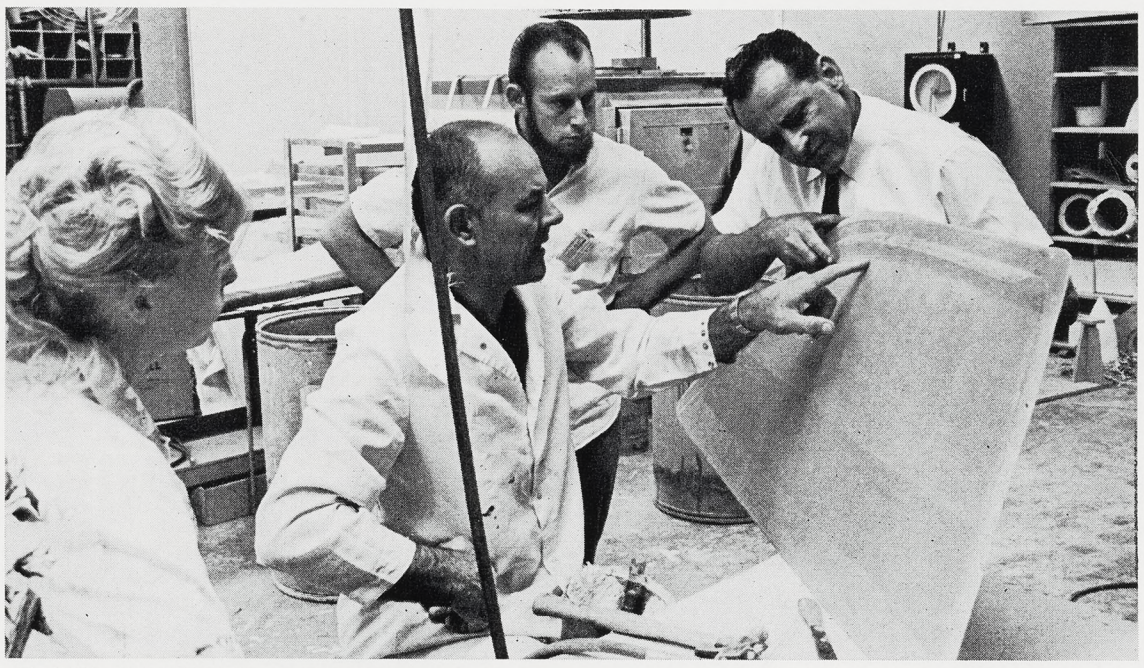
These improvements include:

—A one-time bonus vacation with 80 hours pay for each employee, to be taken between the 20th and 25th year of seniority.

—A four-week annual vacation with pay for employees with 25 years or more seniority.

—Personnel with a minimum of five years' service in an hourly classification who are reclassified

(See BENEFITS, page 6)



PLASTICS FOR AIRCRAFT—Plastics shop personnel are building Northrop Ventura's capability through production of components for both its own product lines and for outside customers. Gathered around aircraft aft wing section, which houses radome developed by the Division, are (from left) Cindy Litzsinger, assembler; Dick Schwend, manufacturing research engineer; Marv Berry, machine operator; and Bill Lang, manufacturing research engineer. (Other photos on page 6.)
Photos by Bob Thornton

NEW ORGANIZATION FORMED

Production Gears for Heavy Competition

A veteran production director, who has observed and participated in plastics technology since its infancy, believes there is a good potential for Northrop Ventura in that field.

Mr. Carroll

Laurence B. Carroll, jr., who last month was appointed director of Manufacturing Engineering at Northrop Ventura, said this week that new applications are being discovered every day for plastics technology and "it is a field that will continue to expand for many years to come."

The Division has more than a half dozen production contracts in progress now—using both high and low temperature techniques—and makes plastic components for its own series of target drones and other product lines.

In addition the Division is performing electronic assembly and test, machine and sheet metal fabrication and assembly, which "makes for a well rounded aerospace capability."

According to M. A. Maurer, vice president-Production Operations, the section was established to so plan and tool a job that it can be accomplished effectively the first time it is introduced.

"In the increasingly competitive aerospace market, this is a necessity, for unless the jobs are bid competitively they will not be won, and if they are bid competitively and won we must then accomplish the task as bid," he continued.

"This fundamentally is the mission of the Manufacturing Engineering Section: to so plan and so tool as to allow the Production section to achieve the acquired efficiency."

As director of Manufacturing Engineering, a newly established organization, Mr. Carroll has a broad range of responsibilities, from budget estimating to tooling.

Three major functions reporting to Mr. Carroll are Estimating and Direct Budgets, Industrial Engineering, and Methods and Tooling.

(See CARROLL, page 6)

Education Refund Aids Ventura Grads

Three Northrop Ventura engineers received degrees last month through assistance provided by the Division Education Refund Program.

Kendall Conger and Jim Raymond both received master of science degrees from UCLA, while Russ Torgerson earned a bachelor's degree in aircraft maintenance engineering from Northrop Institute of Technology.

Mr. Conger is assigned to the Advanced Design branch of the Paradynamics section, while Mr. Raymond is now a senior engineer with Nortronics Applied Research department. Mr. Raymond completed his studies while still a Ventura Division employee.

Mr. Torgerson is an assistant project engineer on the Apollo program.

Air Force T-38's Log Half-Million Hours in Flight

A half-million flight training hours—

This important milestone flashed by during August for the Northrop-built T-38 supersonic trainers operated by the Air Force's Air Training Command (ATC).

To mark the occasion ATC Commander Lieutenant General William W. Momyer took the controls of a T-38 for a flight at Randolph AFB, Texas. At dual controls was Captain Edward W. Wooke of the 3510th Flying Training Group.

Since 1961 the twin-jet has served as the Air Force's basic flight trainer and its first supersonic aircraft ever used in undergraduate flying training. The Air Force has indicated more than 600 T-38s will be assigned to its ATC operations by mid-1966.

Pilots Depart For Annual Pacific Tour

Northrop Ventura pilots began ferrying their F-89 jets from Hawaii to Korea yesterday where they will launch the 1966 tour of Pacific missile ranges to provide U.S. and Allied Army units with target service.

The 10-month tour, which officially gets under way September 5 at Osan Air Base, Korea, will mark the beginning of the fifth year in which missile units of U. S. and allied armies will fire at the Northrop-produced AQM-38 (RP-76) supersonic target.

Republic of Korea units will take part in the annual exercises with U. S. Army batteries.

Other ranges in the Pacific served by Ventura Division are at Taiwan, Okinawa and Hawaii. Similar operations are conducted in the Panama Canal Zone, and staged from El Paso, Texas.

The air-launched RP-76 is only 10 feet long, but simulates full-sized enemy bombers on radar. When launched from the wing of the Norair built F-89, it provides realistic tracking and firing practice for Nike and Hawk missile crews.

In providing this target flight service for the army, Northrop Ventura keeps a crew of two to three pilots and 19 field maintenance and flight technicians on the move in the Pacific for 10-month cycles.

Since completion of the fiscal 1965 cycle in June, the F-89's and other equipment have been in Hawaii for an annual overhaul.

Board of Directors Declare Dividend

Northrop's Board of Directors has declared a quarterly dividend of 25 cents per share, payable September 14 to stock of record August 27.

PACIFIC TARGET OPERATIONS

Flying a Plane Is Least of Their Worries

If you don't mind Labor Day in Korea, Christmas in Okinawa, Easter in Taiwan, Independance Day in Hawaii, and a life of 180 degree turns at 40,000 feet, Northrop Ventura Pacific Flight Operations is a good group to join.

Or if you prefer refueling stops in the midst of a revolution, while rival forces are fighting for the control tower, the same Flight Operations section offers its Latin American swing.

For more details on the former, you might contact Tom Stowe, Gus Nilson or Bill Leese; on the latter, Mike Savino can give a pretty good briefing.

All four men fly Northrop built F-89 jets on yearly rounds of U. S. Army Nike and Hawk missile batteries, where they launch Ventura Division AQM-38A (RP-76) target drones for combat readiness exercises.

And, during peaks of the 10-month tour, the section's director, Dale Johnson, gives up his desk at Newbury Park to help out in the field.

The pilot's are part of the Division's target support service which has been in operation since 1955 and which also includes 19 field maintenance experts and a tracking unit which directs the target's flight after it's launched.

The planes are the F-89J, built at Northrop Norair between 1955 and 1958 for the U. S. Air Force. The F-89's primary mission was as a nuclear armed, all weather interceptor.

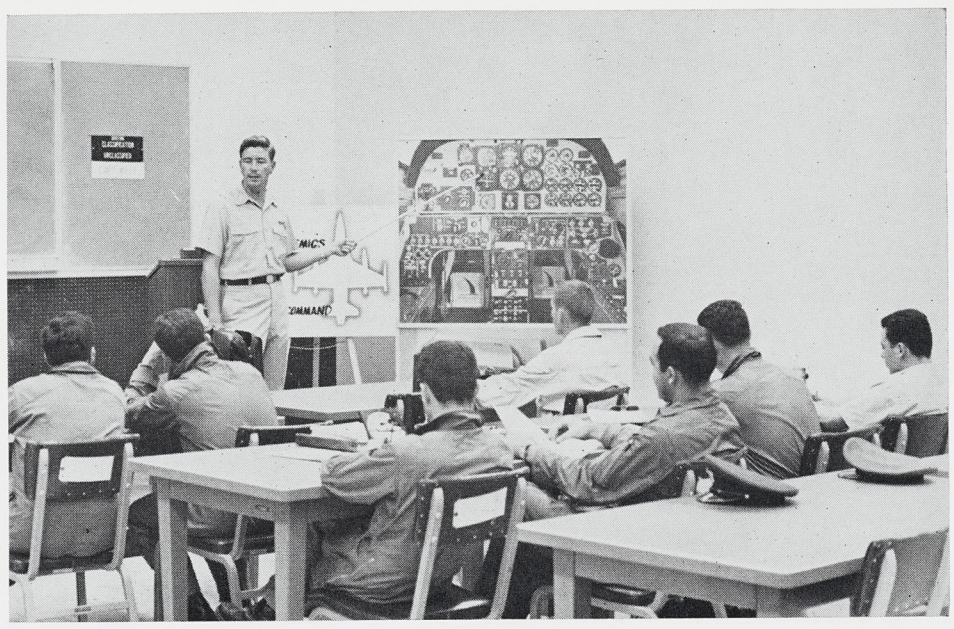
Where a destructive payload once nestled under each wing of the jet, Ventura Division today fits a 10-foot long, solid fuel rocket, which is radio controlled from the ground. Of the six planes loaned to the Army, which in turn loaned them to Northrop, three are used in the Pacific. The other three serve similar target operations at El Paso, Texas, and in the Panama Canal Zone.

"It's the perfect plane for this operation," says Gus Nilson, a former F-86 Sabrejet pilot for the

(See TARGETS, page 6)

NON-LETHAL PAYLOAD—Northrop F-89 is framed by wing tank (top) and AQM-38A supersonic target (below) on wing of another F-89. Planes are used by Northrop Ventura in launching targets for U.S. Army missilemen in the Pacific and Panama Canal Zone.

Williams AFB, Arizona, home of the 4441st Combat Crew Training Squadron (CCTS), is point where cadre from allied nations slated to receive Northrop's F-5 go through specialized training. Pilots take part in one course, maintenance technicians in another. The group above from Turkey are maintenance men at work on-the-job. Men (from left) are Y. Usluduran, Y. Keskin, A. Erguder, S. Kunduraci and A. Durhan. Heavy classroom schedule is augmented by actual maintenance work on the F-5.



U.S. Air Force instructor above goes over cockpit layout of F-5 with pilots from Turkey, Norway and U.S. Air Force during classroom session. Together, they then move to flight line and into the air for further training which includes everything from formation flying to weapons delivery and combat tactics. Graduates return to their own countries to conduct similar training prior to arrival of first F-5s for operational use. Allied nations have been sending personnel to this school for 15 months.

Combat Crews Learn Skills at Williams AFB

DEFENDERS OF FREE WORLD LEARN TACTICS, TECHNIQUES FOR FUTURE

By W. J. B. WEICKERSHEIMER
Staff Writer

Men attending the 4441st Combat Crew Training Squadron (CCTS) at Williams Air Force Base, Arizona, serve many nations, but are united in their dedication to a common cause—the defense of the free world.

For the past 15 months they have arrived there from Iran, Greece, Nationalist China and the Republics of Korea and the Philippines. Late last month a contingent from Turkey completed training, making way for a similar group from Norway.

Students of the 4441st CCTS arrive as hand-picked (by their own government) individuals, experienced pilots and veteran technicians. After approximately four months in a well-defined and meticulously planned program providing complete transitional, operational, service and maintenance training on the Northrop F-5 tactical fighter, they depart as a close-knit, well-trained team.

Graduating teams are, in a true military sense, cadre. They return to their homelands to conduct similar training programs for their own forces prior to the arrival of operational F-5 aircraft.

Williams AFB, the site of this intensive international training effort, is a unique installation.

It is operated by the Air Force's Air Training Command (ATC) which contributes to the effort by conducting academic sessions and providing base support.

The 4441st CCTS is a Tactical Air Command (TAC) organization commanded by Lieutenant Colonel C. K. Voss. It concentrates on the blending of individual skills and the versatile F-5 fighter into effective weapon systems.

This welding of man and machine occurs largely through academic or classroom sessions augmented by maximum personal contact between students and U.S. Air Force counterparts. Training efforts are divided with pilots and technicians taking separate subjets.

For instance, fighter pilots spend about 100 hours in academic training, 50 hours in briefings and critiques, and 40 hours in flight training. The latter spans everything from simple transitional and formation flying to weapon systems delivery and air combat tactics.

Technicians, on the other hand, may devote as much as 250 hours in detailed academic work, augmented by hardware demonstration and on-the-job efforts. The latter involves, in the final weeks of training, actual maintenance of the F-5s being flown by their fighter pilots.

Language is a big barrier, but each student normally attends an English language and aviation English course taught at Lackland AFB, Texas, prior to assignment at Williams.

Many key U.S. Air Force officers associated with the F-5 program have taken part in training at Williams AFB. Colonel A. C. Jackson (right), former F-5 Special Project Officer, is typical. He is shown above prior to flight with Lieutenant Colonel C. K. Voss, commander of the 4441st Combat Crew Training Squadron.

Thus, the average student must be away from his native land for as much as six months to complete the entire training cycle.

Throughout the F-5 training program at Williams AFB, a mixture of nationalities has occurred. That is, students are on hand at any given time from two or even more nations, attending the same classes. In addition, U.S. Air Force personnel destined to work in some phase of the F-5 program have participated in pilot and technician training.

The group graduating last month, designated Class 65-C, was typical of past groups.

It was made up of six Turkish and one Norwegian pilots, two Turkish maintenance officers, and 49 Turkish non-commissioned technicians.

The group began reporting to Williams in April and completed its training with graduation exercises July 31.

Northrop Norair's W. L. Shuck, a technical representative who will be assigned to Turkey, attended a majority of classes involving Turkish technicians. He will be accompanied to Turkey by Paul Ristine, another technical representative.

"These men are true technicians and dedicated military men," Mr. Shuck said. "They are quick to grasp any subject and eager to learn as much as possible about the F-5."

Many of the Turkish students saw the F-5 about this time a year ago when the Northrop-leased F-5B was in that nation on a demonstration tour.

Captain Mesut Gurlman flew the F-5B in Turkey. He continues to be impressed with the F-5's rapid rate of climb.

Lieutenant Dadri Sonnur likes what he calls the F-5's "Cadillac performance."

NORTHROP NORAIR KEY CONTRIBUTOR IN TOTAL EFFORT

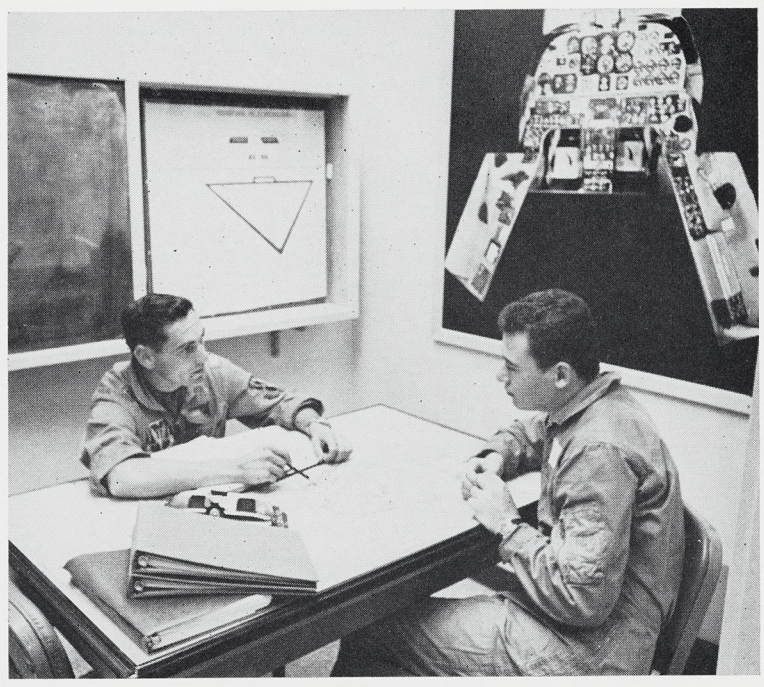
Northrop Norair currently supports the training efforts of the 4441st Combat Crew Training School "as needed", although its contributions to the over-all effort have been extensive.

Northrop Norair helped get the program under way in January 1964 by conducting special classes for future pilot and technician instructors.

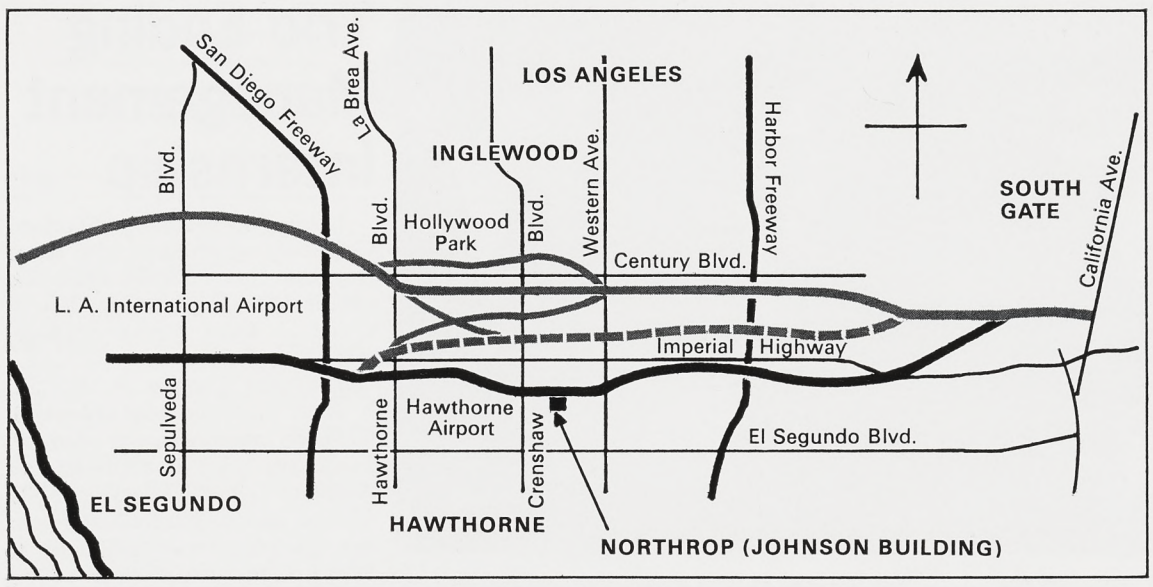
Northrop Norair designed and built the 15 special Mobile Training Units utilized in each detachment training program. In addition, Norair designed and built 15 Mobile Training Units assigned to each nation for in-country training.

Hank Waklee serves as Northrop F-5 Field Training supervisor at Williams AFB and represents all Northrop functions there, coordinating his efforts through the office of Gaylord Anderson, Product Support director of Field Service and Training.

Toward end of transitional training program, maintenance technicians move to flight lines to actually perform F-5 maintenance tasks. They work closely with counterparts from U.S. Air Force. Group above is shown performing necessary assignments in flight line shack. It includes both Turkish and U.S. Air Force personnel.



De-briefing sessions after F-5 flights are important to determine what happened in flight and why. Here Air Force Instructor, Captain Clifford Cooke, talks with Turkish Lieutenant Kadri Sonnur.



Proposed routes of freeway now known as "Freeway Route 42" could place arterial roadway within 140 feet of Johnson Building in Hawthorne, which houses delicate vibration-sensitive instruments. Northrop registered official protest to route outlined in black on map during California State Highway Commission hearing August 13.

Protest Again Lodged At Freeway Hearing

Based on a new report by a recognized authority on vibrations, Northrop has again protested a proposed freeway route adjacent to a Nortronics (Hawthorne) facility on the grounds that traffic would affect extremely delicate instruments.

The southernmost of three possible routes (designated Freeway Route 42) swings southward from Century Boulevard in South Gate, crosses Imperial Highway and runs along 119th Street in Hawthorne within 140 feet of the Nortronics facility.

Testifying before the California State Highway Commission in a public hearing August 13, Robert B. Watts, Jr., assistant general counsel for Northrop Corporation, set forth Northrop's grounds of opposition to the proposed southerly freeway route.

Northrop estimates that it would cost $348,500 to relocate the instruments to the side of the building away from the freeway. This plan could work only if experts determined that low-resonance vibrations generated within the freeway structure under a traffic load would not affect the entire building.

If operation of the facility could not continue within the same building, the costs of removal would be $988,500, according to Northrop authorities.

Neither the estimate for a move within the building or complete removal to a new building include costs incurred because of business disruption during relocation.

Northrop has maintained its position regarding the freeway route since a study by a seismology expert in 1963 indicated that vibrations would adversely affect the Nortronics (Hawthorne) plant.

The expert, David J. Leeds, performed the tests for Northrop as a consulting engineer to the architectural and engineering firm of Daniel, Mann, Johnson and Mendenhall.

The State Division of Highways conducted its own study and obtained results at variance with the study by Mr. Leeds.

A second study by the architect-engineering firm was performed by Dr. T. K. Caughey of the California Institute of Technology, a recognized expert in the field of vibrations. His findings concurred with those of Mr. Leeds.

In addition, Daniel, Mann, Johnson and Mendenhall representatives observed the tests conducted by the Division of Highways and reported that the testing equipment used by them was "completely insensitive to frequencies below 10 cycles per second."

Mr. Watts concluded his presentation to the Highway Commission:

"In view of the significant impact of this proposed freeway routing upon Northrop's critical operations in the Johnson Building, which are essential to the national interest, Northrop requests that the California Highway Commission adopt an alternate routing of the proposed freeway.

VENTURA TO HOST CATALINA WEEKEND

All Northrop divisions are invited to spend a weekend in Catalina September 18 and 19.

Hosted by Northrop Ventura, the weekend outing will begin at the "Magic Isle" terminal in Wilmington, Saturday at 1 p.m. The price is $17.50 per person, and includes round-trip fare on the steamship, lodging at St. Catherine Hotel in Avalon, dinner dance at the hotel and brunch on Sunday. Return is scheduled for 3 p.m., Sunday.

For further details and reservations, please contact personnel activities at Anaheim, extension 244; Northornics Hawthorne, extension 302; Norair, extension 2486; and Northrop Ventura, 425.

Table Tennis Won By P. V.'s Ching

Miller Ching of Nortronics (Palos Verdes) was the big winner in the all-Northrop Table Tennis Tournament staged last month at Leuzinger High School.

Mr. Ching battled his way through a tough double elimination schedule and polished off Les Emerson of Norair in the singles finals.

Then playing with Lou Villalby (Norair), Mr. Ching helped grab men's doubles honors, downing Mr. Emerson and his partner, Bernie Bowen of Norair.

Bev Barnes of Norair stroked her way through the small field of women entered to take singles honors.

Trophies went to top competitors and all Northrop divisions were represented, according to Tom White of Personnel Activities.

Saturn 'Craftsman Ship' Calls at Nortronics PPD

The importance of careful workmanship to the space program was emphasized for Nortronics Precision Products Department personnel by the arrival of the "Craftsman Ship" at the Norwood, Mass., plant.

The 40-foot van visited PPD during its tour of aerospace contractor sites throughout the country, sponsored by the National Aeronautics and Space Administration's Marshall Space Flight Center in Hunstville, Alabama.

PPD is involved in the Saturn space rocket development program, which is directed by Marshall Space Flight Center.

The NASA van contains components, materials and other illustrations of how the lives of astronauts depend on each part of a space vehicle performing according to specifications.

A map inside the "Craftsman Ship" shows the location of Saturn rocket work in 48 states. A space suit similar to those that will be worn during the Apollo manned moon shot is on display, and a dummy astronaut emphasizes the importance of each individual's work.

Other sections of the vehicle show soldering and welding, materials, rocket testing, and captive firing before actual launch. A final exhibit stresses the importance of correct packaging and shipping procedures.

A working model of a Saturn valve and a dismantled valve containing 209 parts are included. The Apollo flight plan is illustrated along one side of the van.

FAA Selects Page For Antenna Work

The Federal Aviation Agency has awarded Page Communications Engineers a contract to expand the capability of a ground/air antenna on the slopes of the world's largest dormant volcano.

The 225-foot high dual band antenna, described as the first of its kind in the world, will be erected next year on Mt. Haleakala, a favorite tourist spot near Honolulu.

Northrop Page previously had won a contract with the FAA to install a VHF antenna, but the new contract calls for UHF capability as well.

The unmanned facility will be operated by remote control from FAA Air Route Traffic Control Center in Honolulu. It will be used in transmission and reception of messages to and from aircraft flying between the West Coast and Hawaii.

It was also was announced this month that Northrop Page had received a $225,000 contract from Rome Air Development Center, New York, for a year-long study of new communications techniques involving extensive use of integrated circuits and computer-type logic.

Rockhounds Of Africa Thank NRC

Special praise for the generosity of Northrop Nortronics (Anaheim) NRC Gem and Mineral Club members has been received from the Republic of South Africa.

Gryffuth E. Dovey, a teacher at the Private Bag Langlaatge Technical High School in Transvaal, wrote the words to Charles and Carolyn Brittenham which were intended for all club members.

Earlier Mr. Dovey had issued a special request. He wanted to start a lapidary workshop among youngsters in his area. But he lacked suitable rock specimens. He asked the NRC group if they would consider sending him a few samples of rocks found by the club on various outings.

In short order, NRC members gathered, packaged and shipped 85 pounds of rocks.

A letter written by Mrs. Brittenham, Club secretary, reached South Africa before the rock shipment.

Mr. Dovey wrote, "I could not believe my eyes after reading the clipping about the collection" (carried in Northrop NEWS).

"My original letter requested a few pounds of material and you big hearted generous folk have seen fit to send me nearly a hunderweight. I cannot tell you how much this will mean to the boys at the school," Mr. Dovey added.

Mr. Dovey said his next move was to build suitable machines for polishing and that ultimately finished works by the students will be exhibited in the school. He further offered to send a few specimens, stamps or coins of his area as a small token of his appreciation.

However, Mrs. Brittenham said the Club will likely decline the offer. "We have received ample payment now, knowing we have helped a group in another nation," she said.

INCLUDING A MAN NAMED NEWTON

Pioneer Leif Erikson Has Lots Going For Him

Leif Erikson has three things going for him that should ensure his veneration for many years to come as one of the great figures in the history of civilization.

Mr Newton

There is his pioneering and enterprising spirit which characterizes development of the New World.

There is the Viking concept of human dignity, the earliest forerunner of modern democracy, which Leif the Lucky and his descendants brought to the New World for the first time.

Then there is the Leif Erikson Association and its sister organization, the Leif Erikson Foundation, which since 1950 have been dedicated to encouraging and rewarding pioneering activities in the humanities.

Activities of the two non-profit organizations range from furthering public recognition of historical facts pertaining to Erikson to making an annual international award for the "most noteworthy discovery or advancement which furthers human liberty and well-being," according to Northrop's Johannes Newton, president and board member of the Foundation.

(Previous recipients of the Leif Erikson Award are General Bernt Balchen, U. S. Air Force, pioneer of the Polar air route and pilot for the Byrd expeditions; Dr. Lee DuBridge, president of the California Institute of Technology; and Dr. Glenn T. Seaborg, pioneer in the peaceful uses of atomic energy).

Among the notable achievements of the two organizations is a successful campaign to have Congress proclaim October 9 as Leif Erikson Day. Highlighting the second annual observance of the day this year will be special World's Fair ceremonies.

"It was a lengthy process, getting the Day proclaimed by Congress," Mr. Newton, an engineer on the Laminar Flow Control staff at Norair, said.

But Association members had help from some pretty impressive quarters. They first approached the Senate Judiciary Committee in 1959 to learn appropriate procedures. They were advised by the committee chairman, a senator named Lyndon Johnson.

After the long process of documenting their claim in behalf of Erikson and collecting thousands of signatures to their petition, another senator, named Hubert Humphrey, made the appeal on the Senate floor. Nine other senators, including Minority Leader Everett Dirkson, made subsequent supporting speeches.

One year ago this month the bill became law.

Mr. Newton, an Icelander by birth, was instrumental in forming

(See VIKING, page 5)

Army Unit Announces Northrop Allocation

The 6164th U.S. Army Reserve Research and Development Unit has announced an allocation for two commissioned officers from Northrop.

Applicants for the field grade and company grade positions should direct resumes to the Unit Advisor, 6164 USAR R&D Unit, 2802 Airport Blvd., Santa Monica, Calif.

JUANITA NEWMAN EARNS CPS RATING

Mrs. Juanita Newman, administrative secretary to Michael Creamer, Director of Plans, Northrop International, has been awarded a rating of Certified Professional Secretary by the National Secretaries Association.

Mrs. Newman

This rating was granted after she completed a comprehensive two-day examination at Long Beach State College. It is shared by only three other Northrop women. Throughout the United States, Canada and Puerto Rico, there are only 3,330 secretaries who have achieved CPS status.

For Mrs. Newman, this recognition comes after two years at the University of Cincinnati, where she achieved a Certificate of Business Administration; and three years in evening classes at El Camino College, Pasadena and Long Beach City Colleges.

It is the intent of the CPS program to give recognition of planned courses of instruction and conscientious and proficient work to further professionalize the secretarial field.

Flight Museum Offers Aviation Film Fare

Continuous showings of a special version of "Those Magnificent Men in Their Flying Machines, and an animated film, "The History of Aviation," are current events at the History of Flight Museum, 9800 S. Sepulveda Blvd.

The museum is open 8:30 a.m. to 5:30 p.m. weekdays with no admission charge.

In driving the freeways on your summer vacation trip, check your freeway maps, determine your point of exit and determine the names of three exits you will pass prior to your turn-off point. This, says the Greater Los Angeles Chapter of the National Safety Council, will permit you to maneuver safely into your exit lane.

NORTHROP NEWS

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ALUMNI MEETING—Northrop President and Chairman Thomas V. Jones (right), a Stanford alumnus, takes advantage of visit of recent Stanford graduates to Corpo rate office to talk about their alma mater. Tom Cotton (left) and Scott McBride (second from left) took part in NSL intern program. Roy Jackson, NSL vice president and assistant general manager and a Stanford graduate too, made the introductions.

PILOT, ARCHITECT, ENGINEER

Darrell Cornell Leads Three Lives

Darrell Cornell modestly admits three contrasting "flames" combine in illuminating his life.

One is lofty, swift and steeped in the elements of the dramatic. Another is slow, solid and with roots deep in the soil. The third is methodical, calculating and intense.

Mr. Cornell

Darrell Cornell is a Northrop Norair Production test pilot at Palmdale, who recently was reassigned from Ventura Division Flight Operations. He is also a graduate architect. And he holds an advanced degree in mechanical engineering.

In the early 1950's Darrell studied architecture at North Dakota State University and took part in Air Force ROTC and Air National Guard activities. In short order he found his schooling interrupted, answered a call to active duty and trained as a jet pilot.

With equal swiftness, he was back in school and graduated as an architect, busy at a part-time job with an architectural firm, in teaching architecture, and in studying for a graduate degree at North Dakota State.

It was during this time his work at the drawing boards began to result in custom homes, commercial and office buildings in the midwest.

By early 1962 Darrell found the desire to return to the air too strong to resist and his experiences in piloting the Northrop F-89 interceptor ample to land him a job as a jet pilot with Northrop Norair.

He joined a task force conducting launches of Northrop-built target drones at El Paso. When this function shifted to Northrop Ventura, he went along.

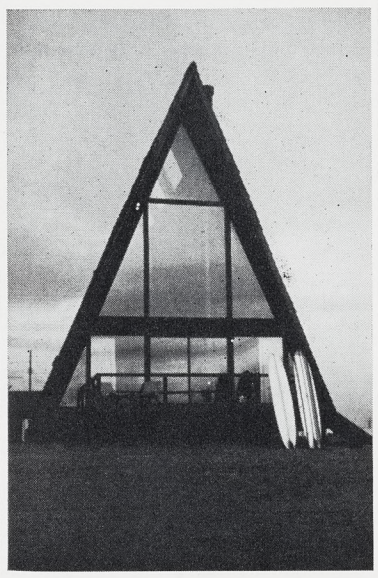
For more than three years he performed as a member of a target drone team in the United States, the Panama Canal Zone, Korea, Okinawa, Taiwan, the Philippines, and Hawaii.

"While we operated in many locales, our programs were usually well-planned and carried out with a minimum of incidents," Darrell said.

"We did encounter some suspense in operating just 50 miles from communist territory, but followed our flight plans closely and used our navigation equipment relentlessly to avoid possible incidents," he added.

Sandwiches in between period of from four to six months abroad were periods spent at the Northrop Ventura plant. There Darrell and other pilots flew light transports on equipment and passenger carrying runs in support of the Gemini and Appollo parachute recovery systems.

There were times when Darrell found himself back at the drawing boards and he dabbled in designing homes.



Isosceles ocean front home above was designed by Darrell Cornell, Norair test pilot, and built at Oxnard Shores for Dale Johnson of Northrop Ventura.

Dale Johnson, Darrell's boss at Ventura, asked him to jot down some ideas for a beach home. The ideas became plans and the plans a beach home now a welcome addition to the Oxnard Shores community.

Darrell's enthusiasm for his new assignment is shared by his wife, Beverly, and his four children, ranging in age from one month to 11 years. They especially like the idea of having him home a majority of the time.

Trio Ending Management Internship

Three top ranking Stanford University graduates will leave Northrop Space Laboratories this month following participation in a unique three month Management Intern Program.

They are Thomas A. Cotton, J. Scott McBride, and Robert G. Oakberg. According to Roy P. Jackson, Vice President and Assistant General Manager, NSL, who is also a Stanford alumnus, the program was designed to broaden the experiences of selected outstanding graduate students and to assist them in establishing their career objectives.

During their three months at NSL, the Stanford trio has been assigned to various senior NSL executives with whom they have participated in the daily decision-making processes.

The idea for the program grew from discussions between Mr. Jackson and Robert Pierce, Director of the Stanford Alumni Association.

"It is important from the company point of view that we be well acquainted with the new technical developments occurring at the universities. By having our executives face to face with these graduates, they are exposed daily to these new ideas and attitudes," Mr. Jackson said.

Dr. Jay T. Thomas, director of Physical Sciences, confirmed this as he mentioned a discussion between himself, some of his mathematicians, and Mr. Oakberg, one of the interns who is a Ph.D. candidate.

The discussion debated the merits of his thesis, a mathematical treatise on the solution of elastic structural systems by digital computer. The concept was new, and after two hours of discussion, all agreed that a significant contribution had been made.

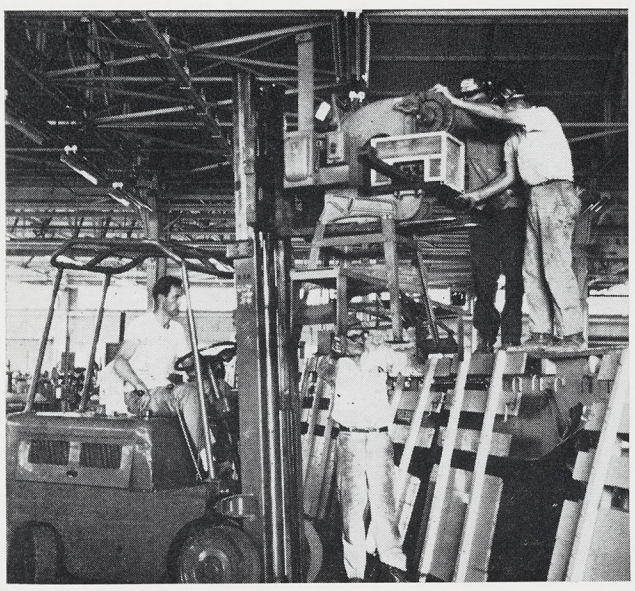
George Muinch, director of Systems Engineering, states that he feels the objective observations by the interns are very helpful, since they are not biased by previous industry association.

Mr. Jackson added that the most significant thing for our people is to realize that there are young people in their early twenties who can work with us and understand the decisions and problems we face.

Mr. McBride was the 1964-65 Stanford Student Body President.

(See STANFORD, page 5)

NORTHROP ARCHITECTURAL SYSTEMS ON THE MOVE



Northrop Architectural Systems began its second move in its five-year history this month as the wholly-owned subsidiary occupied a new 150,000-square-foot building in the City of Industry. Most of machinery was moved (left photo) weekend of June 30 by truck over 11-mile freeway route from old facilities in City of Commerce. While movers were unloading at new $1.6 million plant, welders (center photo) were finishing storage racks for aluminum extrusions (right photo). Transfer of offices was begun August 16. With the move, plant capacity has been increased 40 percent. NAS also has installed processes, such as anodizing and surface treatment of metals, which has been subcontracted in the past.

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills.

Classified

Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Camper, $200, fits Chev or Ford truck, after 5 p.m. Santa Ana, 547-2707. A

Bed, single, w/ft. & hdbrds., sprgs. & matt., $10, Box 1402. A

Deep freezer, upright, 500 lb. cap., $150. Gardena, 324-6277. A

Ford, 1953, V8, 4-door, good trans., $100. Torrance, FR 5-9946. A

Engine, gas, mower or go-cart, $20. Inglewood, OR 1-2058. A

House, 4-bdrm., 1¾-bath, liv. rm. carpeted, large fenced yard, 2-car garage, near Trask & Golden West in Westminster, $450 dn, $17,550. Westminster, (213) DA 9-6297. A

Cooler, evaporation, automobile, w/transformer, for house use, $20. P.V., 377-3806.

Speakers, stereo, 2 walnut cabs., 2′x3′x4′, Univ. spkrs., 15″x8″x6″ w/crossover, custom-made cabs., $300 both. Lakewood, 346-9191. A

Golf Clubs, 1st Flight McGregor, woods & irons, new bag, putter & cart, $100, good cond. Manhattan Beach, 679-6883. A

Austin Healey, 1955, classic, Iskanderian racing cams, new paint, immaculate, $895. P.V., FR 5-4294. A

Motorcycle Trailer, 3 rail, $40. Bell Gardens, 773-2739, after 5 p.m. A

Studebaker Lark, 1959, r/h, overdrive, 2 new tires, $500. San Pedro, TE 2-3177. A

Organ, Baldwin model 40, Orga-Sonic, w/ percussion, philippine mahogany w/matching bench, $695. Redondo Bch., FR 5-3914. A

Sprite, 1959, r/h, $600. Lawndale, 370-6472. A

Radio, c.b., Oslon Spotter "2", 6/12 volt base loaded, antenna M-123, w/5 stations incl., $90. Gardena, DA 4-9593. A

Ford, 1957, convert., 58 Merc. block, 332 cu. in., merc. hvy. duty trans. auto., b/w tuck & roll, 411 rear end, $500 or best offer. Torrance, 370-4101. A

House, 3-bdrm., 1¾ bath, 2 car gar., near schools and Harbor Frwy., pool, 6′ fenced yd., $28,500. Lomita, DA 9-9621. A

Chev., 1954, Bel Air, good condition, $150. Hawthorne, 676-4273. A

Boat, 12′, fiberglassed, blue, w/trailer, $150. Gardena, 324-7053. A

Chevy, 56, 4-dr., V8, pwr. glide, o/hauled, available September 25th, $300. Hawthorne, Box 1401. A

House, 3 bdrm., 1¾ bath, built-ins, fenced yd., $26,500. Torrance, DA 6-7600. A

Sofa, 9′ Riviera uph., beige, $130. Encino, ST 3-9762. A

Sunbeam Alpine rdstr., 1955, rebuilt trans. & front end, new tires, $425. Inglewood, OR 2-6188. A

Hide-A-Bed, Simmons, king size, $35. P.V. Ests., FR 5-5097. A

Movie Camera Equip., Bell & Howell, auto. load cartridge. opt. eye, pistol grip, w/ projector, Director series, telesonic remote control, $250. Hawthorne, OS 6-3290. A

Guinea Pig, Peruvian Cavy, black, long-hair, male, approx. 4-mos. old, $2. Gardena, 329-9484. A

Refrigerator, Westinghouse, freezer top, single dr., $50. Torrance, DA 6-5004. A

Ford Galaxie 500, 1964, r/h, w/s/w, auto. trans., $1850. Hollywood, 656-3475. A

Ford sedan, 1947, custom int., flathead V-8, 15,000 miles, $375. Torrance, FR 8-1350. A

Accordion, Scandalli, 120-bass, case, $125. Los Alamitos, GE 1-4233. A

Bicycle, boy's 26″ Schwinn, 10-spd., derailleur, $25. Inglewood, PL 6-7681. A

Stereo, am/fm tuner, dual amps., dual preamps., 4-spkrs., turntable, $65. Hawthorne, 676-0418. A

Tire Set, 4, near new 5.20 x 12, 2 tubes, Michelin & Pirelli, $25. Manhattan Bch., DI 6-8129. A

Cadillac, 1957, convt., full power, factory a/c, near new tires & brakes, $550. Redondo Bch., FR 5-6773. A

House, 2-bdrm., stucco, alum. siding, 2-car gar., patio, landscaping, 50 x 150 lot, $22,000. Inglewood, 672-5798. A

Guitar, Gibson elec., case, single pick-up, $125. Inglewood, PL 6-7337. A

Bicycle, boy's 24″, med. weight, $25. San Pedro, 833-2584. A

Property, 50x173, zoned for 3 courts, $25,000. Hawthorne, OS 6-0041. A

Record Player-radio-21″ TV comb., new picture tube, mahogany, $100. Rolling Hills Ests., DA 5-3609. A

Volkswagen, 1963, radio, $1250. Hermosa Bch., 372-5985. A

Sunbeam Rapier, 1958, convt., 2 new Dunlop tires, extras, $295. Culver City, VE 9-5438. A

Disc Brake booster unit for 3.4 or 3.8 Jaguar sedan, $25. L.A., 645-8583. A

Jeep wagon, 1952, 4-wheel drive, r/h, hubs, F head, 4-cyl. o/hauled, $795. Reseda, 343-4422. A

Sectional, 4-pc., corner-type, red & black pepper fabric, $135. Hermosa Bch., FR 9-9553. A

For Sale

Volkswagen, sedan, late 1963, 14,000 miles, $1325. Orange, 637-3153. A

House, 4-bdrm., 3-bath, family rm., 3 car garage, fenced, ½ acre lot, $63,900. P.V., 377-6222. A

Chevrolet Impala, 1959, new tires, brakes, trans., $995. Inglewood, 676-3132. A

Home, 2-bdrm., Big Bear, split-log ext. & knotty pine int., full bath, new 30-gal. water heater, furn., financing avail., $1000 dn., $11,000. Redondo Bch., FR 8-2055. A

Model A coupe, 1930, standard, 60% restored, $600. Hawthorne, 675-5337. A

Impala, 1963, 2-dr., r/h, auto. trans., p/s, low mileage, $1795. Rossmoor, GE 1-7765. A

Pups, German Shepherd, pedigree, male & female, $50. Torrance, FR 1-1000. A

Outboard, 5 hp Johnson, $60. Hawthorne, OS 5-1057. A

Mynah Bird, 1-yr-old, says 25 words, cage, $25. Rolling Hills Ests., 673-1097. A

Power Take-off, Detroit Harvester, will fit synchrone mesh gearing, $25. Gardena, OS 5-2159. A

Mattress & box spring, Sears Seraform, 2-yrs-old, $35. L.A., EX 8-8805. A

Ford, 1957, 6-cyl., 4-dr., comp. o/hauled, $325. Hawthorne, 675-6788. A

Sofa Bed, ¾-size convert., spec. fabric, $50. L.A., 645-3986. A

Plymouth, 1958, good trans., $250. Gardena, OS 5-6241. A

Honda 90, 1964, low mileage, $250. Anaheim, 776-9598. A

Bicycle, girl's, 24″, J. C. Higgins, $10. Hawthorne, OS 5-2882. A

TR-3, 1959, convt., new tires, good top, low mileage, $850. W. Covina, PL 6-2587. A

MGTD, 1953, rebuilt eng. & clutch, 1500 miles, $425. Redondo Bch., 375-1396. A

Trailer, teardrop-type, 12′ w/awning, extras, $275. Gardena, OS 6-3472. A

Bedroom Set, Drexel, walnut, contemp. style, dble. mattress & box springs, $85. San Pedro, TE 3-5550. A

Home, 5-bdrm., 2-bath, family rm., ocean view, 2273 sq. ft., 2-car gar., 1-yr-old, $46,000 or lease $325 mo. P. V. Pen., 377-5319. A

Chevrolet, 1956, 4-dr., V-8 stick, $350. El Segundo, EA 2-4606. A

Surfboard, 9′ Bing, $80. P. V. Pen., FR 7-5075. A

Range, gas, dble. oven, broiler, grill, $45. Gardena, 675-2331. A

Stroller, used 1-yr., inc. basket & awning, $7. Torrance, 325-0039. A

Washer, RCA, Mark XII deluxe, hvy. duty, 10-cy., 2-spd., $177. Gardena, 323-9294. A

Mirror, bevelled-edge, 34″x34″, $25. L.A., 476-1635. A

Wedding Ring Set, white gold, w/6 small diamonds, $50. Redondo Bch., FR 9-5865. A

Corvair Monza Spyder, 1962, convt., 29,000 mi., 4-spd. trans., $1295. P. V. Pen., 377-6271. A

Plymouth Savoy, 1955, 6-cyl. o/drive, $150. L.A., PL 4-0078. A

Boat, 15′, fiberglass, w/Walstrong trailer, conv. top, 40 hp Evinrude, Selectric push-button shifting, extras, $1595. Hawthorne, OS 6-9895. A

Pontiac Tempest, 1961, 4-dr., stick shift, 44,000 mi., $695. Torrance, 375-0449. A

Volkswagen station wagon, 1960, $845. Redondo Bch., 379-6681. A

Table, redwood, 2 benches, $15. Hawthorne, 676-7712. A

Camera, Polaroid 800, w/flash gun & attach., $45. Torrance, FR 9-5690. A

Encyclopaedic Dictionary, 12 vol., 1897 edition, collector's item, full page illus., $25. La Mirada, WH 1-6549. A

Trailer, Aristocrat 16′, self-contained, sleeps 4, extras, $1295. Hawthorne, 676-8279. A

German Shepherd, male, 2-yrs-old, AKC reg., very good with children, $25. Orange, 637-3153. A

Ford Mustang, 1965, convert., V-8, auto. trans., p/s, r/h, mahogany dash & steering wheel, spoke hubcaps, 5000 mi., $2750. Inglewood, OS 6-0645. A

Bicycle, girls, 26″, very good con., $15. Gardena, DA 4-8853. A

T-Bird, 1955 porthole, w/'57 Pontiac eng. & trans., $995. Anaheim, 534-8982. A

Home, Moneta Gardens, 182nd & Van Ness, 3-bdrms., family rm., 2½ baths, patio, 2 fireplaces, carpeted, all elec. kit., pool, club house, exc. neighborhood & schools, 4½ miles to Nortronics, $31,000. Torrance, 327-4145. A

Dinghy, 8′ blunt nose, w/oars, $50. Orange County, 549-1000. A

Chevrolet, pickup, 1963, V-8, r/h, auto. trans., o'head rack & custom tool boxes, $1500. Torrance, 371-7205. A

Surfboard, 9′3″, 3 redwood strips, $50. Torrance, 375-9657. A

Sailboat, 14′ Omega class, fiberglass w/ mahogany trim, w/custom trailer & all equip., $800. Redondo Bch., 379-7567. A

Kitchen Set, table, 4 chairs, $30. Gardena, 679-1642. A

For Sale

Austin Healey, 1956, $600. Inglewood, 672-5798. A

Violin, ¾, for school music lessons, $35. Hawthorne, 675-0136. A

Travel Trailer, 15′, $650. Lynwood, 635-8337. A

House, for sale or rent, split level, 3 bdrm., blt. ins, w/w carpets, dbl. garage, $22,500. Redondo Bch., 374-2433. A

Motor, V-8, reblt. auto. trans., for 1955 Dodge, $75. Gardena, DA 4-0158. A

Sectional, aqua, w/corner table & lamp, $40 or best offer. Inglewood, OS 6-1475, after 5 p.m. A

Wanted to Buy

Tape recorder, 2 track, 1¾ ips preferred for voice recording only, San Pedro, 835-8716. B

Boat top, convert., & boat cover for 15′ boat, any condition. Lomita, DA 6-5558. B

Roll of galvanized chicken wire. Manhattan Bch., 376-4787. B

Rentals Offered

Apt, 1-bdrm, unfurn., adults, no pets, $75-$80. Hawthorne, OS 5-1142. E

Apt, 2-bdrm., unfurn., garage, w/light duties, $100 mo. Inglewood, 677-5705. E

Apt, 3-bdrm., 2½-bath, pvt. patio, $156 mo. Inglewood, FR 7-4943, OR 8-5082. E

Apt, singles & 1-bdrm., gar., furn., adults, htd. pool, only 5 min. to Norair, $90 & up. Hawthorne, 673-3633. E

Cabin, Crestline & Lake Gregory, for vacation, sleeps 6, $60 wk. Venice, EX 1-2040. E

Apt, furn., single, util. pd., carpets & drapes, blt. ins, large closets, full bath, 5-min. walk to Hawthorne plant. Hawthorne, OS 5-3792. E

Apt., 2-bdrm., delux, priv. patio, blt-ins, carpets & drapes, fireplace, children & pets O.K., $130, Buena Park. Anaheim, 828-2440.

Apt., 2-bdrm., furn., fireplace, sundeck, ocean view in Hermosa Beach, utilities paid, $135. Hermosa Beach, 372-5808. E

Apt., delux, 2-bdrm., furn., free laundry facilities, 2 blocks to Northrop Hawthorne, $150 mo. Hawthorne, OS 9-7123. E

Apt, near So. Bay shopping center, laundry fac., 2-bdrm., $115. Redondo Bch., 375-6715.

Apt, single, furn., all-elec., ½ blk. to bch., gar., patio, no pets, $90 mo. Redondo Bch., FR 5-8938. E

Studio Apt, 2-bdrm., 2½ baths, deck, subterranean gar., adults, near San Diego Fwy., lease, $175. Inglewood, 373-1143. E

Apt, 2-bdrm., nr. transp., schools, $95. No. Long Bch., 422-6169. E

House, 2-bdrm, in rear, adults, $110. Hawthorne, 675-0617. E

Bachelor Apt, furn., walk-in closet, sep. kitchen area, closed gar., $92.50 mo. Torrance, FR 5-0867. E

Home, 3-bdrm., 1-yr-lease, $175 mo. Hawthorne, 677-4271. E

Apt, 1 & 2 bdrm., all elect., new, 10 mins. from Nortronics PV, furn. & unfurn., $85-$125. Torrance, FR 5-2091, 375-9397. E

Apt, 1-bdrm., util. pd., washer, dryer, pool, 1½ mi. from Northrop, unfurn., $100; furn., $120. Hawthorne, OS 9-7123. E

Personals

Will do your typing in my home, $2 hr. Inglewood, 673-1133. L

Opening avail. in Flying Assoc. at Orange City Airport, learn in 1964 Skyhawk, assoc. limited to student pilots. Anaheim, 714-776-8956. L

For Sale or Trade

Power take off, for 4-spd. Chevy trans., $25. Gardena, OS 5-2159. M

Rambler, 1964, 440 h/t, 14,000 mi., auto. trans., r/h, $1575 or trade up w/cash dif. Redondo Bch., 373-2130. M

Chrome Wheels, 13″ Astros, $90 or trade for 1961-'63 Corvair tires. Inglewood, FA 8-8808. M

Corvair Monza, 1965, 4-spd., AM/FM/SW radio, w/w, 110 eng., 7000 mi., $2000 or trade for 1964 or 1965 Chev. El Camino, w/ air cond. Granada Hills, EM 3-6633. M

Cartop Carrier Rails, set, for compact car, $6 or trade for equivalent for full-size car. San Pedro, 831-5304. M

Driver's Test Forms For TV Show Offered

Northrop Corporation has obtained copies of the "National Driver's Test" which will be repeated on nationwide television August 30.

Test forms may be obtained through Norair Personnel Activities office and all exit gates. Also at Industrial Relations functions at Northrop Ventura and Northrop Architectural Systems.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:30 a.m. — 4:15 p.m.

Xemino & 5th Street, Long Beach. Hoyt F. Shaw, Norair, ext. 1293, GE 9-6018. 3

8 a.m. — 4:45 p.m.

34th & Manhattan Ave., Hermosa Beach. Bernard F. Trudeau, Norair, ext. 2066, 372-1996. 5

Hawthorne & Lennox, Lennox. Bonnie Phillips, Norair, 617. 5

STANFORD

(Continued from page 4)

His home is in St. Louis, Missouri, and he plans to continue his education at Harvard Graduate School of Business Administration.

Mr. Cotton is a Phi Beta Kappa and was selected as the outstanding student of the year. He will continue his studies at Oxford as a Rhodes Scholar. Upon completion of his work in England, he plans to continue graduate work in engineering. Tom is from Dallas, Texas.

Mr. Oakberg is also Phi Beta Kappa. He graduated with great distinction in engineering from Stanford in 1962 and has since been working toward his Doctorate which will require one more year. His home is Coeur d'Alene, Idaho.

VIKING: Sister Associations Venerate Name of Erikson

(Continued from page 3)

the Association and has twice served as its president. The Foundation came into being as a separate organization in 1954.

With members in 25 states, Iceland and Norway, the group is working at present to become even more international. Affiliates are presently being organized in England, Germany and Canada, and the Foundation is planning to increase its board of directors from the present 12 members to 25.

The group also sponsors a scholarship in humanities at UCLA, which is awarded on the basis of "potential to help others."

While the Leif Erikson spirit is not confined to descendents of the Vikings, Mr. Newton himself grew up with it.

"Most every boy in Iceland, as well as Scandinavia, plays 'Vikings' much the same way American boys play 'cowboys and Indians,' he said. "Many times as a child in a make-believe world, I sailed to Vineland (the name Erikson gave to the land he discovered on his first voyage to the North American continent around 1000 A. D.)."

Glenn Seaborg probably best summed up what it is the sister organizations are trying to promote. In his acceptance speech at award ceremonies last January he said:

"Every age has its new horizons, its undiscovered shores, and its new frontiers. And each new age produces its own breed of fearless explorers. Though their journeys have differed in nature, men such as Galileo, Newton, Einstein, Fermi, Columbus, Perry, Piccard, Hillary, and Glenn all carried with them something of the spirit of Leif Erikson and the men of the long-ship.

"Today the future offers new and greater challenges. The horizons are wider, the distances farther. But these yet undiscovered shores will be discovered. They will be discovered and explored, not only because they are there, but because whatever exists and is unknown is a true challenge to the mind and body of man."

FORMER F-5 PROJECT PILOT JOINS X-15 STAFF

Air Force Captain William J. Knight, a former project pilot on the Northrop F-5 tactical fighter at Edwards AFB, has been selected to join the X-15 NASA-USAF research program.

Also named to the X-15 flight team was William H. Dana, a NASA civilian pilot-engineer, who flew the plywood M2-F1 lifting body vehicle which was a forerunner of the Northrop-built M2-F2 manned lifting body vehicle slated for flight test later this year.

Northrop's F-5 can operate from short, semi-prepared or unprepared fields in forward battle areas. This picture seems to indicate such a condition, but is an illusion created by the lens of Ron McGaffin. F-5B above rests on hard-surfaced strip at Brusten, Belgium, during recent Europe demonstration and evaluation program.

SUGGESTIONS NET $35 A MONTH FOR MRS. BASINGER

Pearlie J. Basinger, a Northrop Norair inspector in Electrical Subassembly, may lack an authentic "magic lamp," but has another sure means of augmenting her income — Norair's Suggestion Award program.

Mrs. Basinger

Mrs. Basinger has been earning an average of $35 per month for over a year now through her suggestion activities.

Despite a rejection on her first suggestion submitted in late 1963, Mrs. Basinger submitted her ideas on an average of one per month during 1964 and won award payments on seven. This year she has stepped up the pace and has already earned payments on six of eight submitted. In addition, she has five suggestions still being evaluated and three more just entering the processing routine.

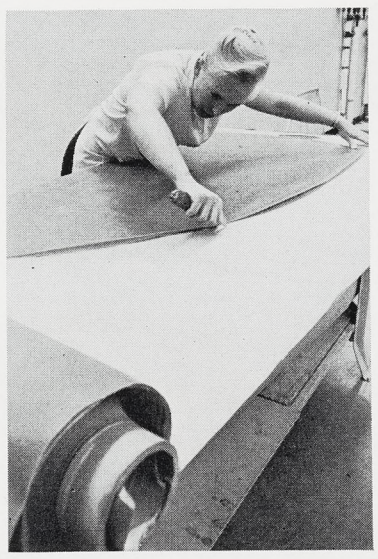
Suggestion Award payments have ranged from $10 to $210 throughout the period. This month she met with Bob Catlin, manager of Quality Control, to receive her 13th award payment.

All of Mrs. Basinger's suggestions have dealt with Inspection and Quality Control routines and most came from observations in her own work area, Electrical Subassembly.

"I submitted my first idea when I noticed others in my area receiving cash payments through the program. My supervisor, Bill Browne, has always encouraged me, too," Mrs. Basinger said. "I find the extra cash helpful for buying the little extra things I might not be able to afford otherwise."

Would she like to share her success secret with others?

"Certainly. Just keep your eyes open and observe what is going on around you. Try to visualize how it can be done better, cheaper or more efficiently," Mrs. Basinger says. "Above all, don't be discouraged.



FAIRING PRETTY WELL—Activities of Plastics Shop are varied and deal with both research and production. Sherman Goldman and Paul Friedman (left photo) are working on vacuum formed camera fairing for Northrop Ventura drone; Cindy Litzsinger (center) and Les Stewart (right) on aft wing section for aircraft.

Whispering Lakes Next Tourney Site

Whispering Lakes, Ontario, is the next tournament stop for Ventura Golf Club, scheduled for August 28, with first tee-off at 10 a.m. Reservations are now being taken, according to Ron Morin, commissioner.

Two special features of the tournament at Whispering Lakes are free use of showers and lockers, and Northrop employees may invite friends to participate.

Winners of the Ojai tournament last month were Bob Schaeffer, Paul Downs and Larry Gosh, in A, B and C flights respectively. The women's trophy was won by Lois Burmahln.

Court of Honor Held By Boy Scout Troop

Even if Doug Finch and Jack Lawrence hadn't been chosen to represent the Northrop Ventura Management Club at a recent Court of Honor held by Newbury Park's Boy Scout Troop 625, they probably would have attended anyway.

Their sons, Mike (Finch) and Brad (Lawrence), were among six scouts elevated to first class rank by the troop, which is sponsored by the Northrop Ventura club.

In his official capacity as treasurer of the troop, Mr. Lawrence conducted ceremonies which advanced tenderfoots to second class scouts.

BENEFITS: Package Includes Wage, Other Improvements

(Continued from page 1)

to a salaried position will retain for 90 days all earned credits under the Extended Layoff Benefit Plan. Thereafter, such credits will be reduced at the rate of 5 percent per month.

—An increase in maximum daily allowance for hospital room and board from $28 to $30 per day for employees and an increase from $24 to $26 per day for dependents.

—An increase in surgery benefits along guidelines established by the California Medical Association and based on detailed schedule which is being made available to all employees. Numerous other improvements in group insurance policies will be made available to employees.

—An amendment to the Retirement Plan has been submitted to the Northrop board of directors designed to increase the amount of time allowed an employee to decide upon early retirement in the event of layoff. The amendment proposes the time be increased from the present 10 days to a period up to 24 months providing seniority is retained.

According to Industrial Relations Rex Fairless, three of Northrop Ventura's fringe benefits—holiday pay, sick leave and vacations—are the best in the industry.

Mr. Douglas added that:

"The continuing objective of Northrop's policies in the personnel field is the satisfaction of the real needs of the men and women of Northrop. Your management feels that these improvements will meet this objective and provide benefits which are comparable to the best practices in our industry."

NVRC Keg Leagues Roll September 7

Northrop Ventura bowlers are now forming winter leagues and will begin rolling September 7.

A men's scratch league will be held at Conejo Bowl, Tuesdays at 6:30 p.m. Contact Dan Cashier, ext. 373, or Mike Novak, ext. 475 for more information. Also at Conejo Bowl is a mixed foursome, on Thursday at 6:30 p.m. Contacts are Joe Boandl, ext. 570, or Marty Frank, ext. 687.

Camarillo Bowl will host a mixed foursome on Wednesdays at 6:30. Phone Herb McKinney, ext. 407, or Marty Frank, ext. 687 for information.

Rounding out the winter league schedule is a mixed foursome at Woodlake Bowl, on Friday evenings, 6:30 p.m. Virgil Crane, ext. 278, and Les Myers, ext. 228, are contacts.

Jack Silvers, bowling commissioner, can be reached on ext. 537 for additional information on any of the leagues.

Navy To Use Nortronics Info System

Two large screen information display systems are being produced for the U.S. Navy by Northrop Nortronics at its Palos Verdes facility.

One system will be used for the training of anti-submarine warfare students at the Pacific Fleet Task Force ASW Training Center, San Diego, Calif., as part of the ASW simulator being produced by Lockheed Electronics Company, Plainfield, New Jersey.

The other system will be used in the Bahamas to graphically present missile and weapons testing both above and below the sea at the control center of the Navy's first underwater test range, the Atlantic Underwater Test and Evaluation Center (AUTEC), Andros Island.

Northrop Nortronics' information display systems incorporate projectors which depict movements onto screens in real-time and multi-colors. Each system is designed to perform specific display functions.

Northrop's contract from Lockheed for the San Diego display is for $316,000, and the underwater test range display system is being built under a $150,000 contract awarded by International Telephone and Telegraph Corporation, Federal Laboratories Division, contractors for the underwater range.

CARROLL

(Continued from page 1)

In announcing the appointment, Mr. Maurer pointed out that the new director is "particularly knowledgeable in matters of tooling, bonding, and metal and plastics fabrication."

Mr. Carroll gained a great deal of his knowledge in these areas during his 20 years with Fairchild Hiller Corporation. He was director of Operations there prior to joining Northrop.

Fairchild Hiller became active in plastics prior to World War II when it was a fledgling technology. Since that time, Mr. Carroll says, plastics has grown to include so many techniques and diverse products that a complete capability in this area is virtually impossible.

TARGETS: From Tropics to Alaska

(Continued from page 1)

Air Force. Mr. Leese and Mr. Stowe are also former Air Force pilots, while Mr. Savino flew for the Marines.

Mr. Johnson is another F-89 enthusiast, and estimates the Division will keep them in service through 1970. After a stint as a test pilot during World War II, Mr. Johnson joined Northrop in 1948 as an engineering test pilot, and was one of the elite group of pilots who flew the famous Flying Wing bombers on test flights over the California desert.

He flew the F-89 during its research and development stages at Norair.

When Ventura Division was awarded its first contract to provide launch support for its RP-76, Norair provided the pilots and maintenance crews under subcontract. Ventura took over complete responsibility for field support activities in 1962 and the aircraft operation was transferred.

While the day-to-day target launching is routine, the real challenge to pilots is the ferrying operation between Hawaii and Korea in August and from Okinawa to Hawaii on the return trip in May.

In fact, the three men who ferry the planes probably hold some kind of record for being "rescued." Mr. Johnson says one of the most unsung heroes is the Air Rescue Service.

The ARS has Both Air Force and Navy aircraft in the air at all times in the Pacific as a precautionary measure, Mr. Johnson says. "We have an arrangement with them whereby they station 'duckbutt' aircraft at mid point of the long hops and give us navigational and communication aid."

(Some of the longer legs of the journey, such as the 1312 nautical miles between Wake Island and Guam exceed the navigational capability of the F-89).

Pilots also have to be continuously conscious of fuel management on the long hops as well.

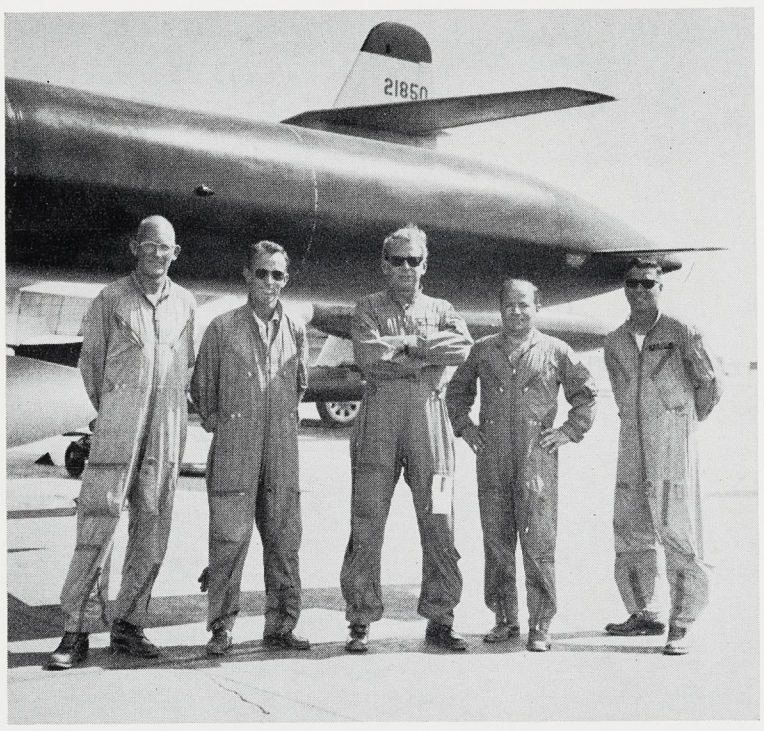
While ferrying to the Canal Zone is not as complicated, it's still a test to a pilot's nerve.

One of the refueling stops has been Mexico City. Because of the airport's high altitude (7000 feet), the plane cannot give maximum takeoff performance. And the revolution mentioned earlier actually occurred in Guatemala City while Mr. Savino was enroute to the Canal Zone.

"There was no radio service from the airport," he said, "and when we landed we noticed the control tower was a shambles."

When asked whether they would rather fly over the ocean or jungle on the ferrying missions, the pilots agreed one was as dangerous as the other. But they like to fly and they'll go anywhere.

They even took on the freezing cold of Alaska at one time, and succeeded in the first air launched target program for missile units there, where all others had been unable to operate.



ON LOCATION—Northrop Ventura Flight Operations personnel stop at Wake Island for refueling while ferrying three F-89's from Taiwan to Hawaii last spring. Crew members (from left) are Harold Hawley, crew chief; Jim Randall, electrician; Dale Johnson, section director and pilot; Mike Cantelmo, crew chief; Tom Stowe, pilot. Pilot of the third plane on the ferrying mission was Gus Nilson, who took the picture.

NORTHROP NEWS

NORTHROP VENTURA

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Gemini Five Added to List of Successes

The record-breaking Gemini Five space flight of Astronaut L. Gordon Cooper and Charles Conrad which ended August 29, also left unbroken the record of successful operation for Northrop Ventura's parachute landing systems.

Beginning with Alan B. Shepard's suborbital Mercury flight on May 5, 1961, Northrop landing systems now have been credited with perfect performance in the recovery of all 10 astronauts who have flown in the nine manned space missions conducted by National Aeronautics and Space Administration.

Throughout the eight-day Gemini Five mission, public attention was focused upon minor difficulties within some spacecraft systems which upon occasion threatened to terminate the flight prematurely.

NASA officials, however, pointed out that the difficulties had been exaggerated and praised the "unsung heroes", the many systems which escaped attention by working perfectly.

"It is a tremendous pleasure," said Dr. George E. Mueller, associate NASA administrator for the Office of Manned Space Flight, "to congratulate the flight crew, the flight operations crew, the program office, the manufacturers, the DOD support, the DOD launch team.

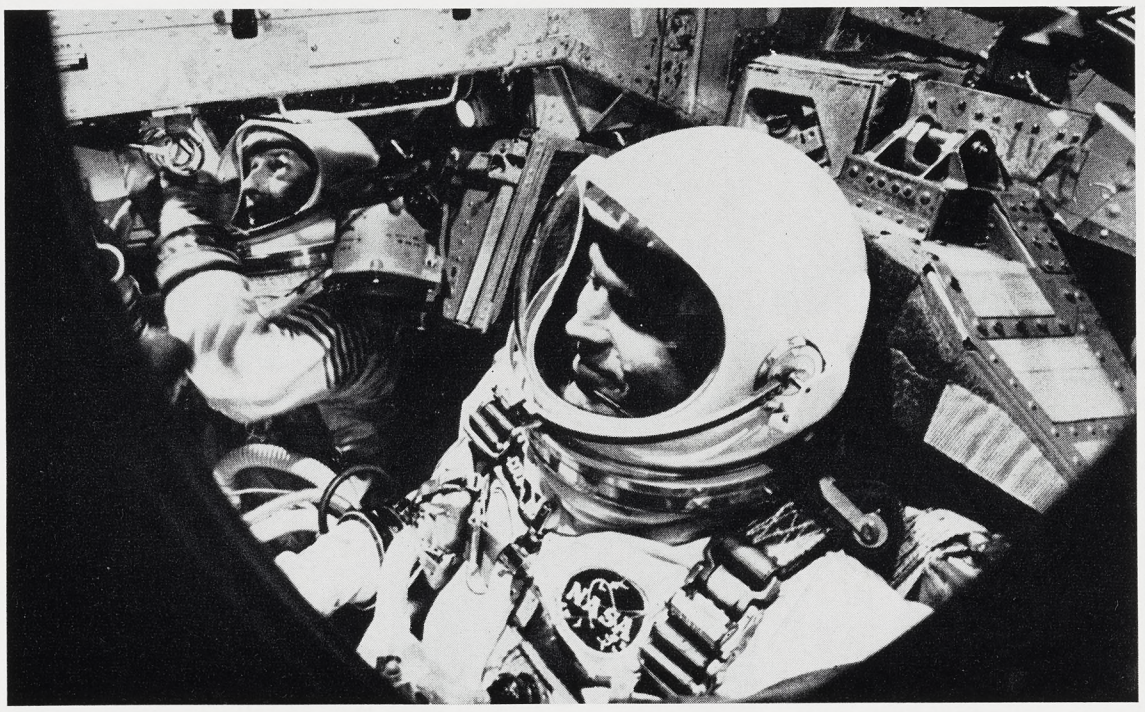
"It was a perfectly wonderful example of men going into space. I think every single member of that broad team deserves a heartfelt thanks."

Dr. Robert R. Gilruth, director of NASA's Manned Spacecraft Center, also praised contractors whose equipment worked perfectly.

"I think the way some of these headlines come out," he said "tends to over-emphasize some of the difficulties that occur and don't give credit to all the literally hundreds of systems that worked perfectly.

"An eight-day flight of a device that has to be as complex as

(See GEMINI, page 6)



THEIR HOME FOR EIGHT DAYS—Gemini Astronauts L. Gordon Cooper, jr. and Charles Conrad, jr. are shown at controls of spacecraft they manned for eight-day flight. At conclusion of flight a Northrop Ventura-built recovery system lowered them gently into the recovery area. Gemini 5 chalked up numerous space records and proved man could survive a trip to the moon.
Photo courtesy of NASA

Where Else Can You Get Beef Goulash a la Zsa Zsa Over Bow Tie Noodles?

When Cafeteria Administrator Bob Wilson and Chef Armand LeBlanc put their heads together at Northrop Ventura, the results are something that cafeteria diners around the country would envy.

For example, take these excerpts from tomorrow's menu:

Slowly roasted fancy lovelace turkey

Apple mushroom savory dressing

Homemade cranberry sauce

Snowflake potatoes

French petite peas

Deep dish apple pie with hot vanilla sauce

Shredded carrot and pineapple salad

or

Budapest beef goulash a la Zsa Zsa over parmesanned bow tie noodles

or

Mayan spicy cheesed enchilada with frijoles refritos

And tomorrow is "Make Your Own Sundae" day with bibs and skis furnished.

Mr. Wilson applies himself to planning a menu for each day of the week with the enthusiasm that many of his patrons take on when they apply themselves to the delectable results of his imagination.

And when Chef Armand applies his French Canadian savoir-faire to the raw materials, the difficulties inherent in cooking for many diners do not make themselves felt on the palate.

Behind the scenes, in the Ventura kitchen, lie a host of tools and appliances that make possible the presentation of a variety of dishes in the condition they were meant to be served in, hot when they should be, chilled when necessary, soft and tender or crunchy and crusty.

In the kitchen, just about everything gleams with tile and stainless steel. There are three walk-in refrigerators, each kept at its own prescribed temperature, and within the coldest refrigerator lies the door to the zero degree freezer, protected by a 34-degree buffer zone against hot summer air.

There are four ranges, two deep fryers, 10 ovens, a three-door pressure cooker, two 60-gallon steam kettles, and innumerable reach-in refrigerators.

Between the kitchen and the dining room is a 12-door food storage cabinet. The food goes in six doors on the kitchen side and is kept at about 180 degrees. It comes out the dining room side a few minutes later, still hot and fresh, to reach dining trays within moments.

The cafeteria serves about 20

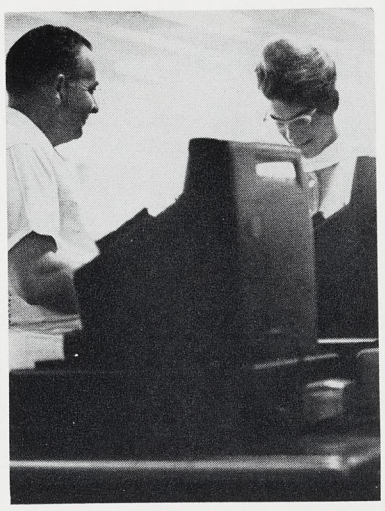
(See CAFETERIA, page 6)

EIGHTEEN ELIGIBLE FOR SERVICE PINS

The following Northrop Ventura employees are eligible for Northrop service pins during September:

Fifteen Years: Maxine Buchanan, Roland Harvey, Thelma Iddings, and Ralph James.

Ten Years: Earl Clark, Earle Hammond, Martin Frank, Ray Gage, Henry Widmer, Daniel Caine, Gladys Ellisen, Eleanore DeGroote, Helen V. Clark, Charles McVean, John Clancy, Joseph Phillips, Hugh Crossman, and Wilbur Leeds.



Final step for patrons of cafeteria may be friendly smile and word from Bob Wilson, cafeteria administrator, who sometimes doubles as cashier. During recent vacation of Chef Armand LeBlanc, Mr. Wilson cooked.

Big Booster Recovery Is Possible

Technical problems involved in recovery of big boosters of the Titan, Saturn and post-Saturn eras have been solved or are now within the state-of-the-art, according to Theo Knacke of Northrop Ventura's technical staff.

The big question facing developers today is: "When will re-use of boosters requiring a full-scale recovery program become economical?"

Since the booster itself accounts for only 30 percent of the total launch costs, Northrop Ventura cannot answer the question about re-use economies, Mr. Knacke said this week.

"All of our studies since 1960 have been made with a clear understanding that recovery is an important—but only a part—of a complex re-use cycle," he continued.

"Such cost parameters as recovery operations, refurbishing of the vehicle, number of launches possible with the same booster, re-use reliability, range operations, turn around time, cost of upper stages, and many others must be considered as well."

The Division is assuming, however, that the $30 million cost of the Saturn 1B booster, which is programmed for Apollo and future space station missions, will tip the economic scales in favor of recovery, if the booster can be re-used three to four times. Similar considerations apply to Titan, Minuteman, and the big solid strap-ons used on Titan 3C.

This is in line with other studies made by booster manufacturers, DOD agencies, NASA-Marshall Space Flight Center at Huntsville, Alabama, the responsible agency for the Saturn program.

(See BOOSTERS, page 6)

FORSYTHE TV SHOW PREMIERE INCLUDES T-38 AND PALMDALE

If some of the scenes in the new John Forsythe Show which premieres Monday, September 13, on television seem especially familiar to Northrop people, there is a reason.

Part of the opening show was filmed at the Northrop Norair Production Flight Test facility at Palmdale. And a sleek Northrop-built T-38 Talon trainer is frequently seen.

Unseen in the show, but very much a part of it, is Major Roy Boyd, F-5/T-38 project officer for the Northrop Air Force Plant Representative. He was at the controls of the T-38 seen taxiing in from the runway and checked Mr. Forsythe out in cockpit egress techniques. The in-flight shots of the T-38 were provided by the Air Force Information Services Office. Major Boyd was flying the T-38 seen by the audience. The photo plane was piloted by Captain P. H. Blue, chief of the AFPRO Quality Assurance Division.

AFTER 37 YEARS

Scotsman Takes Five Week Trip 'Home'

Alexander (Scotty) Blackwood says he's too used to the American way of life to ever change, but when he describes the sunset over Loch Lomond you know there is a lot of Scotland left in him.

Scotty, a welder in Northrop Ventura's Production department, has just returned with his wife Margaret from a five-week pilgrimage to his clan headquarters in the sleepy little town of Bishop Briggs, a 15-minute bus ride from Glasgow.

"It's nice for a vacation, but I couldn't live there again," he said with a brogue as thick as the morning mist on a Scottish moor. "Everything is too slow and easy going for comfort."

On the plus side, however, is "a friendly bunch of people that are easy to get along with," the pastoral beauty of the countryside, and 30-60 pound salmon hungry for a hook in the highlands.

It was Scotty's first visit to Scotland since he came to the United States 37 years ago. It was also the second time he has crossed the Atlantic to fulfill an ambition.

"My mother was born here, and she used to tell me when I was a kid to go to California when I grew up," he reminisced.

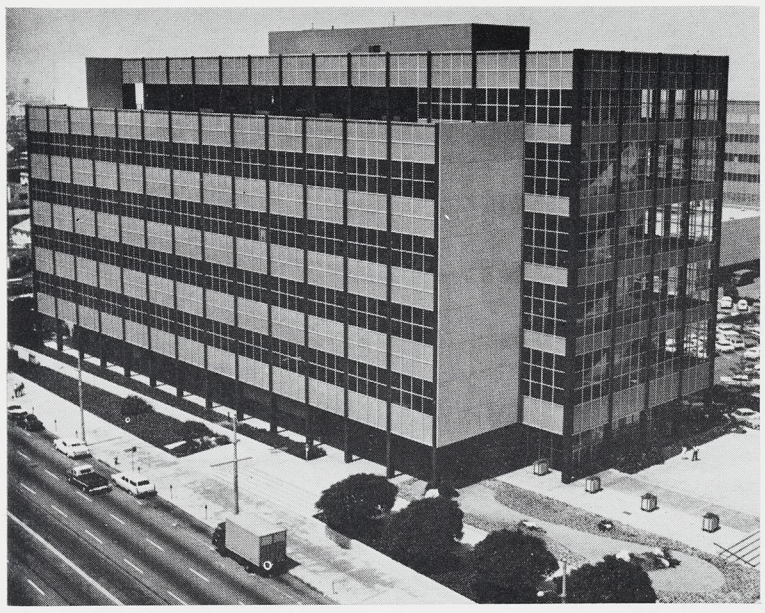
After an apprenticeship in the shipyards of Glasgow, he took her advice and became a teenage emigrant to the U.S.

"But I spent 19 years in Detroit before I made it to California, but now I'm here to stay," he added.

But even though he became a dyed-in-the-wool American, there was still a yearning to see the homeplace and his relatives again.

It was a homecoming for Margaret as well. She and Scotty grew up in the same town. They later met again in the U.S. and were married.

While most of the Blackwoods' vacation was spent relaxing in the hillside village, they took a tour of London and visited some of Scotland's more renowned locales.



Long Beach's Municipal Court Building stands near Pacific Curtainwall, Inc., Northrop subsidiary, as example of company's aesthetically designed exteriors.

Twin landmarks of downtown Los Angeles, Music Center, right, and Department of Water and Power building, were major exteriors to credit of PAC/WALL. Firm performed engineering, fabrication of hardware, wall installation.

Pacific Curtainwall: New Faces for Our Cities

While most of Northrop's divisions are busily engaged in defense and aerospace production, a subsidiary of the Corporation is decorating municipalities with a new look in building exteriors.

Pacific Curtainwall, Inc. (PAC/WALL), has participated in such projects as erection of Los Angeles' internationally famous Music Center, the renovation of a high-rise building that has landmarked San Francisco's skyline since the turn of the century, and architectural efforts on an international scale.

In 1963 the company received the American Iron and Steel Institute's Design in Steel Award for the exterior of a building in the University of California San Francisco Medical Center. Prior to that, in 1957, the company received an award for craftsmanship from the American Institute of Architects.

Pacific Curtainwall designs, fabricates and erects bearing and non-bearing wall enclosures known in the building trade as curtainwalls. Located in Long Beach, the firm has been an influence on architectural exteriors since 1955.

Ten years ago, when PAC/WALL was founded by Douglas B. McFarland, president, most buildings utilized load-bearing wall construction.

The fact that exteriors were formed as bearing walls limited architects and engineers in their consideration of aesthetics. Curtainwall came as a major improvement, permitting greater design flexibility with the added benefit of lower cost. It also lends itself to the remodeling of older structures that otherwise would have to be completely rehabilitated or demolished, or remain as eyesores within the community.

One such major face lifting

DOUGLAS B. McFARLAND
PAC/WALL President

was for the Home Mutual Savings and Loan Building at Kearny and Market streets in San Francisco. The cost to completely rehabilitate the structure was estimated at some $4 million. A curtainwall exterior was designed and erected by PAC/WALL at a cost of $140,000.

Another noteworthy exterior rejuvenation took place in Oklahoma City, Oklahoma, where the Republic Building was curtainwalled for $340,000.

Ten percent of PAC/WALL's business is such remodeling of older buildings.

Their credits for new structures include Norair's Engineering and Science Center (1957); Colon Building, Mexico City; Thunderbird Hotel, El Segundo; Providence Hospital, Anchorage, Alaska; Metropolitan Water District headquarters, and the Department of Water and Power Building, completed this year across from the Music Center.

Incidentally, the Colon Building and the Providence Hospital walls have remained undamaged through a number of earthquakes that have hit hard during the past few years.

PAC/WALL utilized 3 to 3½ million pounds of aluminum extrusions and sheet stock during fiscal 1965. In comparison, Northrop divisions engaged in aerospace work require between 3¼ and 3½ million pounds per year. The extrusions used by PAC/WALL need not meet military specifications, but they are designed and fabricated to extremely close tolerance.

The dies are designed at PAC/WALL and production of the extruded material is carried out in the plants of suppliers. Within the administrative building of the architectural subsidiary is an array of some 500 extruded samples for which the dies are valued at from $50 to $500 each, not including design hours. The mating surfaces must match precisely to fit the bearing structure and to maintain the integrity of the building envelope.

The new Music Center, for example, required 22 sheets of design drawings out of a total of 156 engineering drawings for the curtainwall. Complexity of design and construction, including two walls that form portions of an elipse, led to many hours on the drafting boards.

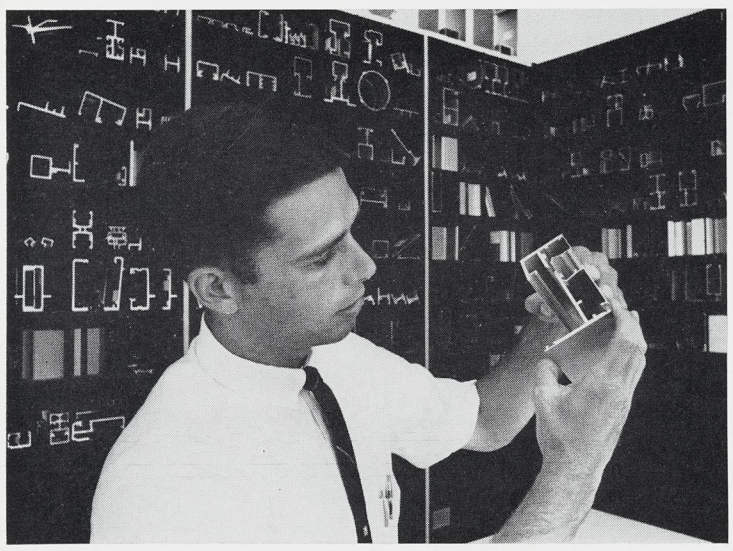
When PAC/WALL first opened its doors in an office on Wilshire Boulevard, Los Angeles, manufacturing processes were subcontracted. Only engineering and design were performed by the company.

The firm soon moved to Long Beach and in 1956, a year after its inception, began performing its own assembly work.

Now, aluminum cutting, fabrication and assembly, and steel assembly are performed by PAC/WALL, as well as coating of metals with mechanical finishes.

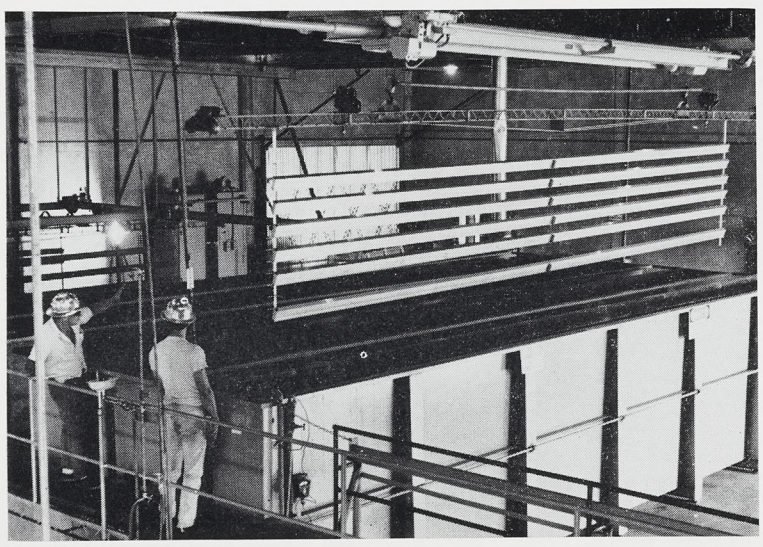
Curtainwall can be made from stainless steel or enamel-coated steel as well as from aluminum, sometimes with decorative coat-

(See CURTAINWALL, Page 5)

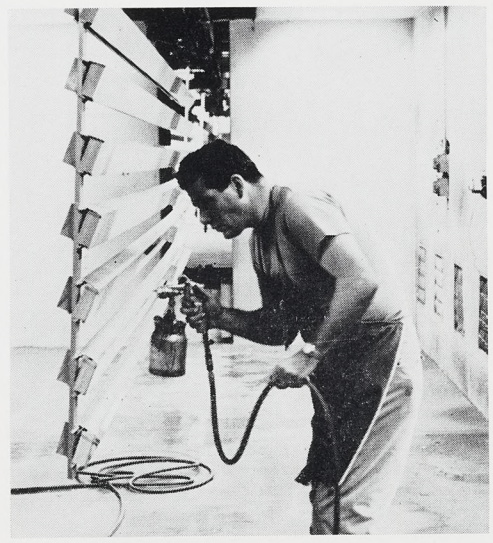


Two-piece aluminum extrusion sample in hands of Bob Eastin, design engineer, typifies complexity of materials used in erection of non-bearing walls.

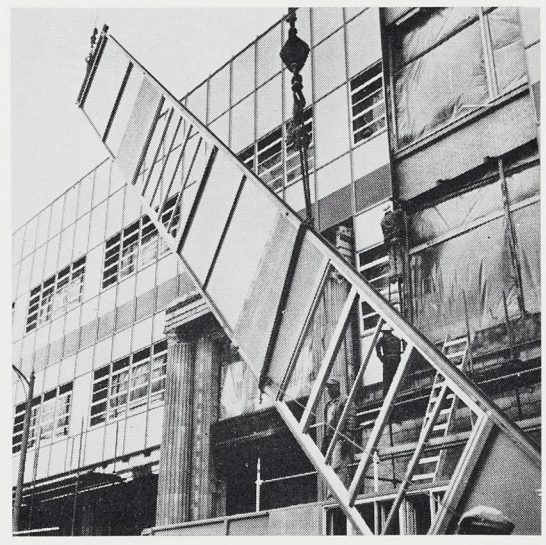
Metal and glass portions of Engineering and Science Center walls were major effort of Long Beach firm in 1957, before they joined Northrop family in 1961.



Curtainwall assembly in plant requires processing of 25 and 30 foot lengths of aluminum and steel. Here 25-foot structure is immersed in wash tank. Next bath will be in chemical conversion coating tank, and by two rinses.



Environment-resistant enamel helps protect extruded aluminum lengths. When Tony Arredondo finishes, material will move into 33-foot oven.



Renovation of older building at lower cost than otherwise possible is accomplished by application of preassembled curtainwall. Installation crew is PAC/WALL's.

New Division Chiefs Join AFPR Staff

Two new divisional chiefs have joined Northrop Corporation Air Force Plant Representative (AFPR) office headquartered at Hawthorne.

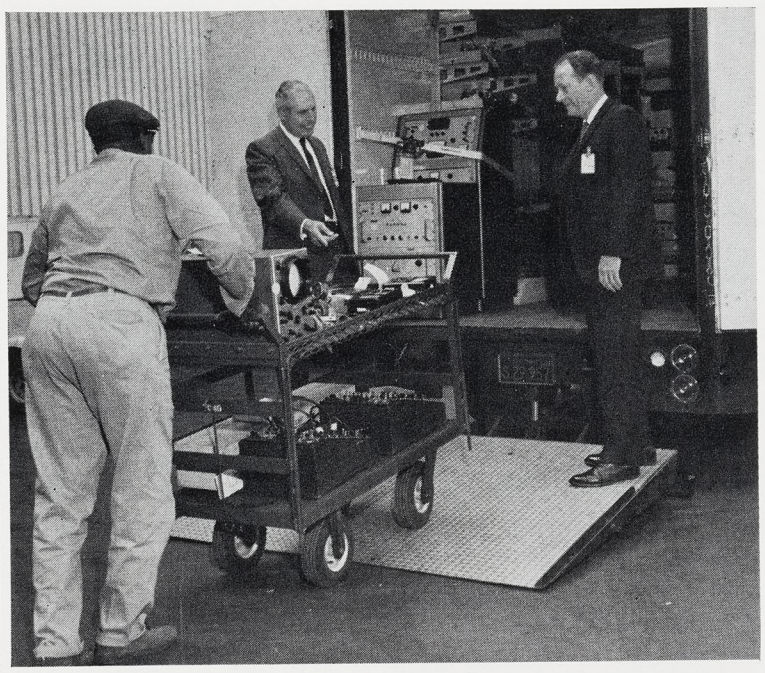
Major Howard D. Clarke assumed duties as chief of the Developmental Engineering Division and James E. Hill became chief of Contract Administration.

Mr. Hill replaces Maxwell G. Pellerin who retired from government service after a long career, including the past eight years at Northrop. Major Clarke replaces Major J. A. Dean jr. who is retiring from active military duty.

Among the departing mementos presented Mr. Pellerin was one outlining his association with Northrop penned by his Northrop friends. One noted his long service, competent representation of the Air Force, and his help and guidance in all contractual matters.

Major Clarke is a veteran of 17 years in the Air Force who has served for the past five years at the Space Systems Division, most recently as assistant director for Gemini B.

Mr. Hill comes to his new assignment from the AFPR office at Lockheed Burbank where he was responsible for contract administration from 1952. Between 1944 and 1951 he also served at Lockheed prior to spending a year as manager of contracts for an Arizona aircraft firm.



HANDLED OH SO EASILY—Bob Catlin (left), Norair manager of Quality Control, shows Larry Knight, NSL chief of Quality Control, how easily driver Jim Westly loads precision measurement and test equipment into new transportation van. Note secured load inside van which handles average of 825 pieces between use points and Standards and Calibration Laboratory.

TOUR SERVICE PLANS FREE TRIP FOR LUCKY HAWAIIAN TRAVELER

There will be one free trip to "alohaland" for some lucky participant taking part in the year-end NRC-sponsored group excursion to Hawaii.

Surl Kim of the tour service booking the trip will award one free trip to some lucky participant signed for the excursion. A drawing will be held the first week in December.

Meanwhile, a group meeting for all interested in the trip will be held at 7:30 p.m. September 22 at the NRC Clubhouse, Hawthorne. Mr. Kim will be on hand to show movies and answer questions.

This year's venture departs December 24 and returns January 2. It will include visits to Kauai, Hawaii, Maui and Oahu islands. An assortment of entertainment and side trips is included.

The cost is $378 per person and includes jet air fare, transportation, lodgings, some meals and sightseeing.

Information is available through Personnel Activities offices throughout Northrop.

'Kangaroo' Does Trick For Metrology Hops

While some aspire to a tiger in the tank, Northrop Norair has selected a more docile animal—the mother kangaroo—as a pattern for one of its latest innovations.

This is a motorized van, a sort of mobile kangaroo, which provides the comfort, safety and protection afforded young kangaroos in their mother's pouch.

Norair's innovation, however, is used in moving some 18,800 pieces of delicate electronic and mechanical precision measurement and test equipment between points of utilization and calibration throughout the division and Northrop Space Laboratories.

Distance involved may be only a few hundred yards or many miles.

Regardless, equipment carried is treated as what it most often is—delicate and costly instruments of a highly sensitive nature, easily damaged and subject to loss of calibration.

Quality Control's Standards and Calibration Laboratory drew up the specifications for the enclosed van and recently took delivery from the builder.

The van measures 21 feet long and eight feet wide. It has a custom hydraulic lift, special springs and shocks and oversized balloon tires of the low profile type. Its interior features adjustable padded shelves or racks and a multitude of toggle clamps with which to secure rack-mounted instruments of any size. It also boasts its own special cart for handling smaller loads and moving items from cribs or vans.

Despite its ability to handle delicate loads, the van is made to perform on highways and makes runs once each week to Norair's Antelope Valley facilities and was pressed into service recently for a special load for the U.S. Navy's Point Mugu installation.

Bob Catlin, Norair manager of Quality Control, calls the new van an "answer to a long-time need at Norair" and estimates it will result in savings of over $6100 in its first year of operation.

Art Ohlemacher, general supervisor of the Standards and Calibration Laboratory, notes the new equipment is helping "streamline calibration and repair handling procedures with its handling of an average of 825 pieces of equipment each week."

Ice Follies Ticket Discount Offered

Arrangements through which Northrop employees may procure discount tickets for Ice Follies of 1966 productions have been made by NRC.

The Follies will be staged September 9 through 23 at the Los Angeles Sports Arena and September 24 through October 3 at the Long Beach Arena.

Special order envelopes may be obtained through all Personnel Activities or NRC offices and other outlets.

AL KIEFER WORKS HARD AND—

Jenny Flies All Out—But Autos Still Pass Her

Al Kiefer is a study in paradox.

He lives in a world of manned spacecraft orbiting the earth at many times the speed of sound and jet transports that race the sun. His work brings him into daily contact with supersonic jets.

Mr. Kiefer

Yet Al Kiefer likes nothing more than a chance to talk about the 23 hours he has logged flying a vintage aircraft that can not match the speed of mere automobiles on freeways below him, an aircraft that has thrice let him down, once ending nosedown in a pile of wreckage in an open field.

Still Al Kiefer is a contented man, doing just what he has dreamed of doing for years.

The fact he can even fly his 1918 Curtiss JN4-D Jenny with only four instruments, a top speed of 62 mph and a range of 150 miles is almost as remarkable as his part in its restoration.

The Jenny is a lady with a past, the first airplane mass produced in this country. She was a prime trainer for World War I aviators and once a very common sight. Her later exploits with barnstorming pilots and aerial stuntmen made her well known. But by the late 1930's she was a thing of the past, seen only in museums.

At present Al Kiefer's JN4-D is the only known Jenny capable of flight.

Al, a staff assistant in Northrop Norair's Materiel operations, and a partner, R. T. (Doc) Hood, former Northrop Nortronics engineer, pooled their resources and talents in 1957 and set about what appeared then to be an impossible task — the complete restoration of a Jenny.

They acquired a quantity of parts and went to many sources seeking others. Aviation historians were willing helpers.

For instance, one remembered that in 1938 he had seen a Jenny in a vineyard barn in the vicinity of Fresno. But that was about all he recalled. Al and Doc started a long and systematic search, picking up bits of information here and there. They finally located the object of their quest and bought a flock of parts from the owner who then lived in Illinois. This was only the beginning. There were other quests in burned out buildings, trash heaps, buried under mud piles, etc. And there was a parallel search for any type of drawing or information available.

Each incoming piece was carefully cleaned and restored. Then came the long and difficult task of putting all the pieces together and fabricating new parts and pieces where original ones were missing.

By 1960 Jenny began to look more like an airplane and by 1962 she was together completely. Al and Doc had spent more than 2000 hours each in restoration work, exclusive of time spent in research and search.

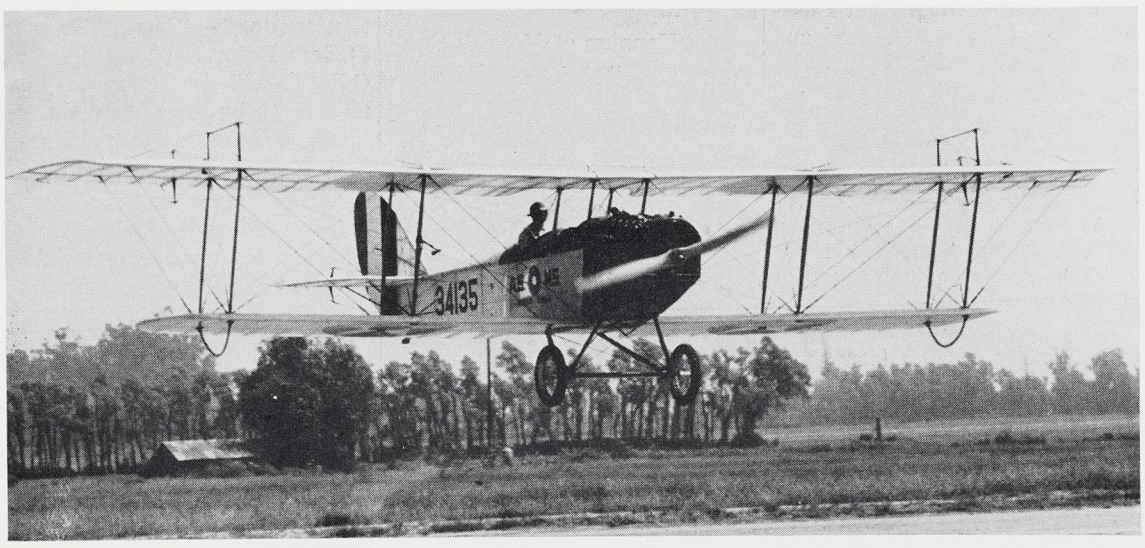
"We had found that the man, Mark Campbell, who inspected our Jenny at the Curtiss plant in 1918 was working for Lockheed,' Al said. "We got him to help with our inspection routine, a task he performed with pleasure and vigor, although some four decades separated his work on the plane."

Al had flown some in "unlogged" situations earlier, but now set about getting his license. Doc still does not have his, although he plans to get one so that he, too, can fly the Jenny.

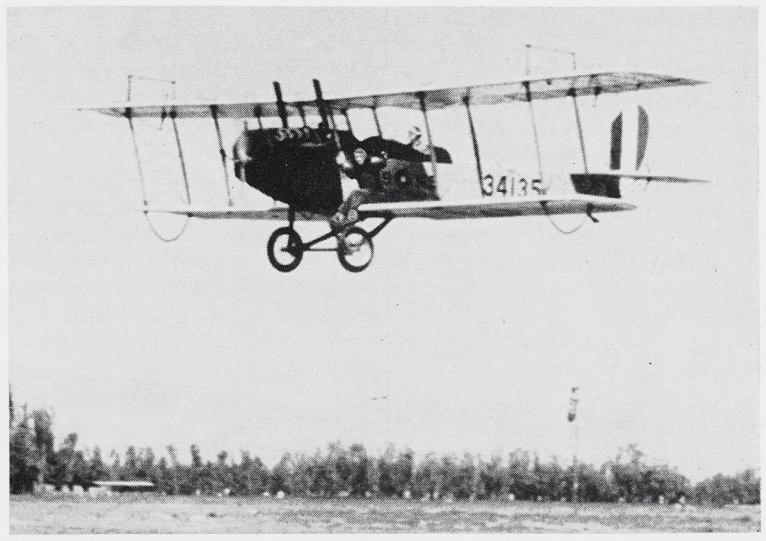
Following FAA certification, Al Kiefer took the restored Jenny aloft for her second "maiden" hop. But a few months later, in late 1963, he was forced to crash-land her in a field near Ontario. Much of the restoration had to be repeated, although a quantity of extra parts were now on hand.

Now based at the Ontario International Airport, the Jenny is an active part of an aerial museum and is taken to air shows in the Los Angeles area. She is a pampered and sought-after lady

(See JENNY, page 4)



Al Kiefer Lands Restored 1918 Curtiss Jenny



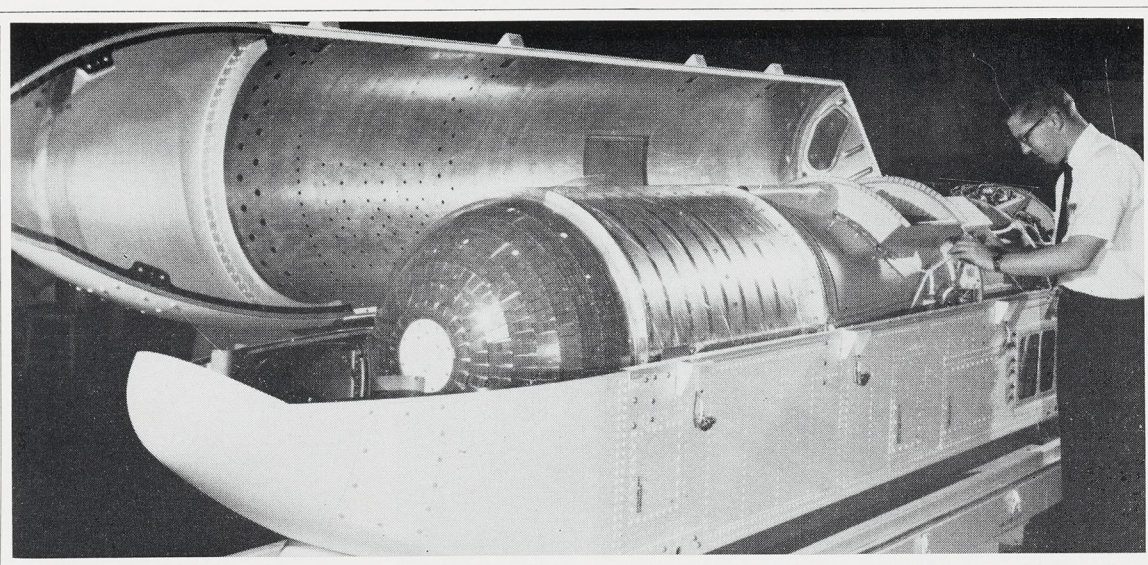
Bob Hannum Waves from Wing

Radiation Belt Payload Set For Launch

A Northrop payload is scheduled for orbit this month in the inner Van Allen belt as part of an Air Force program to investigate the requirements for protection of man against radiation hazards in space.

According to Mac Chapman, project scientist, the Flight Experiment Sub-satellite (FESS) will be the first Northrop payload placed in orbit. If the present schedule holds, FESS will precede the OV2-1 satellite (developed and built by NSL) into space by two weeks. The satellite carrying the FESS payload is the OV1 vehicle (built by General Dynamics Convair), and will be launched by an Atlas booster from Vandenberg Air Force Base, California. The satellite will be the prime payload on a refurbished Atlas. Both the OV1 vehicle and the Atlas launch vehicle are furnished by the Office of Aerospace Research (OAR).

The FESS experiment was initiated by the Aerospace Medical Research Laboratory (AMRL), WPAFB, as a piggyback or bonus payload in the OV1 satellite program. The satellite, also called the ARS, is in the OV (orbiting vehicle) series and is designated OV1-2. The FESS program is currently being directed by the Biophysics group at the Air Force Weapons Laboratory (AFWL), Albuquerque, New Mexico.



READIED FOR LAUNCH—Technician at General Dynamics Convair, San Diego, inspects completed package for September launch of FESS biosatellite. Propulsion module has been mated with satellite and placed in the pod which will be bolted to Atlas launch vehicle. General Dynamics provided pod and propulsion module, while Northrop developed instrument package designed to obtain data on radiation doses in space.

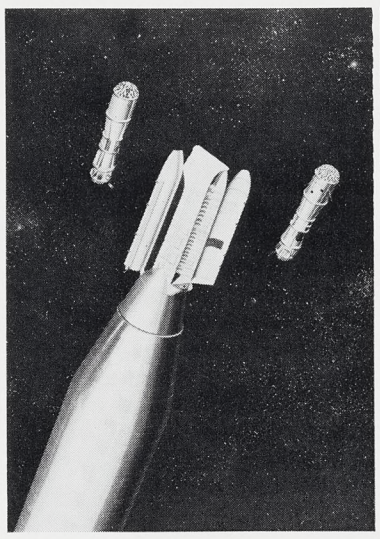
Dr. T. A. Farley of UCLA's Institute of Geophysics, consultant to Northrop Space Laboratories on FESS program, reviews instrument design data with M. C. Chapman, project scientist.

Primary purpose of the Northrop payload is to obtain experimental data on radiation doses in space in support of computer analyses of radiation shielding. A theoretical computer program to calculate radiation exposure has already been developed by NSL.

As an important phase of the Air Force's biological testing, the experiment includes:

1. Evaluation of current computer programs to predict radiation doses inside space vehicles, including assessment of the importance of radiation anisotropy and energy spectra to radiation shielding calculations, conditions that are most difficult to simulate in a ground laboratory;
2. Measurement of electron, proton, and X-ray dosages in materials (including tissue-equivalent material);
3. Gathering of geophysical data, including measurement of the energy and spatial distribution of particles trapped in the Earth's magnetic field (Van Allen zones).

Complementing the NSL experiments will be two government-furnished experiments, one each from Air Force Weapons Laboratory and Aerospace Corporation.



Sketch shows how FESS will be injected into space from atop Atlas booster. Propulsion modules of satellite will fire the payload into a predetermined orbit.

The satellite will be orbited at an inclination of 35 degrees, with perigee of 236 nautical miles and apogee 1836 nautical miles. Over the experiment lifetime of 6 months, greater than 100 million pieces of data will be returned to earth for analysis.

The material distribution of the vehicle was experimentally determined, and these data in conjunction with simultaneous geophysical and dosimetric data will permit assessment of the importance of radiation anisotropy, energy spectrum, and vehicle material distribution to calculations of proton depth-dose distribution, bremsstrahlung dose, and total tissue dose. A separate contract for analysis of data obtained by the instrument package has been awarded to NSL, Mr. Chapman added.

The experiment is unique in that, to date, no space experiment has been performed to establish a confidence level to be associated with analytical methods of calculating radiation dose in space.

The NSL Physical Sciences section, Nuclear Sciences Laboratory, was responsible for all the scientific aspects of the program including design and calibration of the instruments, while the Systems department was responsible for instrument development and testing. R. W. Bratt served as project manager.

Dr. T. A. Farley and C. R. Benjamin, consultants from the Institute of Geophysics, UCLA, contributed unique techniques in the design of the partical spectrometers, based on phoswich (scintillation) phenomena. Dr. Farley will also participate in the analysis of the geophysical data.

CLAY RECALLS VJ DAY

Tice Was First in Japan After Cease-Fire

While Americans commemorate the World War II victory over Japan each September 2, Northrop's Clay Tice observes a personal VJ Day a week earlier.

Mr. Tice

Colonel Tice (USAF, retired), an executive with Northrop International, was the first American to land in Japan after hostilities ceased.

It was August 25, 1945, and the colonel, then a lieutenant colonel and commander of the 49th Fighter Group, was leading the group on a sweep around Kyushu, the southernmost Japanese island. One of the pilots, Flight Officer Douglas Hall, reported a fuel system malfunction and a shortage of gasoline.

They turned for the base at Okinawa but F/O Hall was using up fuel so fast it became apparent he couldn't make it. Despite rumors of resistance from the Japanese it was either ditch at sea, a dangerous maneuver, or land in Japan.

Col. Tice and F/O Hall both dropped their single 1000-pound bombs at sea and headed for a fighter base airstrip at Nittagahara on the east central plain of Kyushu.

"I buzzed the field several times," Col. Tice said, "to test for ground fire. There were planes parked along the strip but the base appeared deserted."

Col. Tice set his plane down first. He let it roll to the end of the strip and turned it around fast to take off down wind if necessary.

The remaining 10 planes of the 49th were buzzing overhead ready to provide cover fire if the Japanese opened up on the landed P-38.

Col. Tice waited at the end of the strip about five minutes. All was still quiet. He radioed F/O Hall to land and the young pilot brought his plane in and wheeled it around beside Col. Tice's.

"There was a Japanese Tony fighter parked nearby," Col. Tice recalls, "and I thought maybe I could fly it back to Okinawa and let Hall take my plane."

There was still no sign of life around the strip as the pair went over and examined the Japanese fighter.

"It was no go," Col. Tice said. "I found out later you need an external starting unit for the Tony."

The P-38s still in the air were running low on gas and the colonel had to decide quickly what to do.

"I went back to my plane and radioed to ask if there were any air-sea rescue planes in the area." A B-17 off the east coast of Japan piloted by Lt. Edward Hawkins intercepted the message.

"I knew the field would be a tight squeeze for a '17 but I asked the pilot if he could land and give us some gas. Lt. Hawkins said he could and asked for the location.

"Our other '38s were forced to leave before the B-17 reached us and it got mighty lonesome down there. We were sure there were some Japanese around but we didn't know where, or what they planned to do."

Col. Tice's suspicions proved correct. Only minutes later three Japanese officers appeared walking toward the two pilots and their planes.

"Hall and I were naturally apprehensive, but as they got closer we were relieved to see that they were unarmed except for their swords. They halted about 10 feet

(See TICE, page 5)

JENNY

(Continued from page 3)

now. And she has won a flock of prizes.

Al's longest flight was some 78 miles and a real experience.

"We have no compass and I fly with a wingman or by watching landmarks," Al says. "And while I love every minute of it, it is work, real hard work."

In addition to their desire to restore an aviation great, the partners also like to re-create situations as they were in the Jenny's heyday.

Bob Hannum of Norair's Quality Control was a recent participant in such an endeavor.

"Bob is a former sky diver and stuntman and very graciously consented to helping me re-create the feel of handling Jenny with a man on the wing," Al says. "We took off and he climbed out and took a perch on the leading edge of the wing, gaily waving to astonished spectators below."

Bob and Al now have a better feel for what the old barnstormers experienced in yesteryears.

Right now Al has another objective in sight — a real cross-country flight. He wants to fly, in Jenny, all the way from Ontario to San Juan Capistrano.

Underwater Radio Tests Successful

Experiments conducted in the waters off San Francisco Bay by engineers of Astro Technology Corporation of Palo Alto, Calif., a subsidiary of Northrop Page Communications, may lead to important advances in underseas radio communications.

As the result of recent experiments, Astro Technology engineers believe a high-frequency underwater communications system may be feasible for use in oceanographic and anti-submarine warfare programs.

According to Engineer Norman C. MacLeod, Astro Tech has not only sent audio and video signals over distances previously considered impossible, it has sent them at much higher frequencies than was previously thought possible.

Working from fishing boats outside the mouth of San Francisco Bay, a 250-watt transmitter was used to drive an antenna which was lowered to a depth of about 250 feet. Using a 20-foot dipole antenna and a frequency of seven megacycles, the men established communications over a distance of about 1500 feet.

Signal range has been shown to have a direct relationship to antenna length, indicating that range can be increased by extending the baseline of the antenna, Mr. MacLeod said.

Teachers Will Be Nortronics Guests On Education Day

Northrop Nortronics (Anaheim) is again mapping plans for participating in an area-wide Industry-Education Day set for September 10 in Anaheim.

This annual event makes it possible for teachers in public schools in the area to visit local industrial firms, to learn something of their business operations, plans, and products. These teachers, in turn, may use the material in teaching their classes during upcoming school terms.

Nortronics (Anaheim) has been a participant in this program for a number of years, playing host to educators from the area.

Each visit lasts for about four hours and includes briefings by top Nortronics officials, a luncheon and a tour of factory and assembly areas.

Secretaries Pick Petersen to Speak

Some timely comments on a timeless topic—"The Philosophy of Zero Defects in the Home and Office"—will be delivered September 21 by Dave Petersen, director of the Northrop Norair Zero Defects Program.

Mr. Petersen will address a meeting of the Twin Harbor Chapter, National Secretaries Association, meeting at the San Pedro Hacienda.

All Northrop secretaries and their guests are invited to take part. The dinner meeting begins at 6:30 p.m.

Reservations will be accepted until September 17 with Rita Harris, ext. 2436 at Norair, the reservationist.

Total cost, including dinner, is $2.75 per person.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Bicycle, 10-spd. French racing-type, never used, $60. PV Pen., FR 7-5075. A

Bicycle, 10-spd. racing-type, $35. Anaheim, 776-9598. A

Gladiron, 24″ Thor, $15. L.A., 645-3986. A

Washer, Kenmore, automatic, $100. Hawthorne, OS 5-1057. A

Bar, w/4 stools, Hong Kong made solid rattan, $90. PV, 377-6222. A

Archery Equip., custom bow, 45 lbs., w/case, $8. Culver City, VE 9-5438. A

House, 3-bdrm, 2-bath, built-ins, pvt. atrium, nr. schools, beaches, $31,900. Torrance, FR 8-1350. A

Corvette, 1964 fast back, 365 hp, r/h, new tires, 4-spd., $3500. Hollywood, OL 6-3475.

Typewriter, portable Remington, case, $10. Los Alamitos, GE 1-4233. A

Movie Camera, 16mm, mag. ld., Revere turret lens, projector, 16mm Keystone, screen, $100. Box 1501. A

Home, Hollypark, fireplace, 3-bdrm, 1¾ bath, C & D booth in kitchen, early American int., $26,900. Gardena, DA 9-3767. A

Buick, 1954 conv., p/s, p/b, $175. Canoga Pk., 341-3525. A

Fiat, 1960, 1200 series, 4-dr., good tires, $295. Torrance, FR 5-9946. A

Chain Hoist, ½-ton, $20. Inglewood, OR 1-2058. A

Jaguar, 1960 3.8 sedan, 4-dr., p/s, p/b, Becker FM-AM, auto. trans., $1450. El Segundo, 322-5207. A

Bedroom Set, maple, twin beds, mattresses & box springs, dresser w/mirror, $35. Box 1502. A

Cooler, rm.-size, evaporation-type w/stand, McGraw Edison, $32.50. P.V. Pen., 377-3806.

Bedroom Set, twin beds, 9-drwr. dresser, 2 lamps, nite stand, $50. Gardena, 679-1642. A

House, 2-bdrm., 1-bath, lge. patio, lot 50x150, fenced backyard, landscaped, alum. siding, $22,000. Hawthorne, 672-5798. A

Range, gas, Wedgewood-Holly, 1963, sep. oven & broiler burners, hood, fan, rotisserie, yellow, 42″ wide, $145. Garden Grove, 537-6760. A

Pool Table, boy's, 5′x3½′, live cushions, $25. Hawthorne, OS 5-0645. A

Pistol, Ruger .22 cal., 4½″ barrel, 9-shot auto., $32.50. Torrance, 328-5655. A

Dodge, 1957 4-dr. h/top, conv., V-8, r/h, auto. trans., p/s, p/b, $425. Torrance, 375-9657. A

Dining Table, console-type, walnut, extends to 90″, $45. Lomita, 547-2716. A

Vacuum, Kirby, all attachments, $60. Inglewood, OR 2-2564. A

Utility Trailer, good tires, lights, top, $50. Hawthorne, OS 9-3978. A

Jaguar XKE, 1962 conv., low mile, wire wheels, extras, $2895. Garden Grove, 892-3552. A

Plymouth, 1960, 2-dr. 6-cyl., stick shift, $495. South Gate, LO 6-4306. A

TV, 21″ AM-FM radio, 3-spd. record player console, blonde, modern, $50. Manhattan Bch., FR 4-8036. A

Chevrolet, 1964, Impala, SS, p/b, p/s, factory air cond., r/h, $2850. Ontario, 714-984-4660. A

Motorcycle, Montesa, Super Impala, 175cc, near new, $450. Redondo Bch., FR 1-1988. A

Telescope, 6″ astronomical, excellent mirror, equatorial mount, portable, w/3 eyepieces, $199. Manhattan Bch., 379-4775. A

House Trailer, 27′ Peerless, tandem wheels, new tires, insulated & furn., $650. Hawthorne, 676-1471. A

Stove, Imperial, 4 burner & oven, clock, timer, $20. Manhattan Bch., FR 4-8608. A

Mercury, 1953 h/top, 1956 Cad. eng. & race Hydro, new shocks & brakes, $350. Torrance, DA 9-6174. A

Washer, Philco automatic, $35. Torrance, 371-1086. A

Ski Boat, 15′ fiberglass, Anthony Jetstar w/70 hp Mercury & trailer, $950. Torrance, 370-4778. A

Chevrolet, panel truck, 1954, r/h, new paint, good tires & brakes, $245. Wilmington, TE 4-0362. A

Oldsmobile, Starfire, 1958, conv., p/b, new battery, deluxe radio, $850. W. Covina, PL 6-2587. A

Apts, 1-yr-old, 4 units, 2 & 3 bdrms., disposals, built-ins & car ports, $45,000. Inglewood, OR 7-8797. A

MGTD, 1953, 1500 miles, reblt. eng. & clutch, good tires, new paint & top, $425. Redondo Bch., 375-1396. A

Carpet, w/pad, 14′x16½′, $100. Inglewood, 673-0306. A

Ski Boat, 18′ w/trailer, Chrysler eng., extras, $3000. Norwalk, UN 5-8863. A

Coffee Table, mahogany, $10. Torrance, FA 8-4243. A

For Sale

Typewriter, manual, Underwood, w/stand, $15. Gardena, DA 9-7447. A

Corvette, 1964, 300 hp eng., 4-spd., 2 tops, AM/FM, $3200. Anaheim, 776-4969. A

Refrigerator, Servel, 18 cu. ft., 2-dr., 70 lb. freezer cap., shelves in door, $75. Torrance, DA 6-5663. A

Dodge, 1961, auto. trans., heater, big eng., $600. Inglewood, OR 8-0250. A

Honda 90, 1964, black, $260. Inglewood, 677-4048. A

Jig Saw, Craftsman, 18″ w/steel power tool table & walker turner, ⅓ hp ball bearing motor, $55. Huntington Pk., 589-9503. A

Dodge, 1956, 4-dr., r/h, new seat covers, $300. Torrance, FR 1-1905. A

Cabin Cruiser, 32′ Hunter sedan, 115 hp Chrysler Crown, sleeps 6, radio, d/f, autopilot, $6700. San Pedro, TE 3-8903. A

Ford, 1957 conv., 1958 Merc. block, 332 cu. in. Merc. hvy. duty trans., auto., 411 rear end, $500. Torrance, 370-4101. A

Tenor Sax, Buescher, gold, $125. Manhattan Bch., FR 4-6003. A

Blonder-Tongue, BCT99 UHF converter for channels 14 to 83, $12. P. V. Ests., FR 5-0867. A

VW, sunroof, 1962, good tries, 1965 eng., many extras, $1050. Torrance, 323-1698. A

Hide-A-Bed, Simmons, brown & gold thread, $85. Hawthorne, OS 6-8842. A

Volkswagen, 1957, new sunroof & paint, r/h, good tires, $750. Anaheim, 714-897-9075. A

Bedroom Set, twin beds, dresser, hampstand, mattresses, $75. Inglewood, 678-3318.

House, 2-bdrm. on R-2 lot, $16,000. Torrance, FR 1-0629. A

Malibu Super Sport, 1965, 327 eng., 4-spd. Muncie, h/d suspension, $2585. Gardena, 631-6763. A

Dresser, hi-boy & night stand, antique white w/gold trim, $25. Orange, 637-0013. A

House, 1 mile to Research Park, 4-bdrm., family rm., 2 baths, all built-ins, patio, fenced & landscaped yard, $41,900. P. V. Pen., PL 7-5181. A

Home, 3-bdrm., 1¾ bath, new water heater, patio, block fence, 2-car gar. w/650 cu. ft. storage area, $26,500. Gardena, DA 3-0379.

Travel Trailer, 16′ Jewel, elec. brakes, sleeps 5, $795. Fullerton, LA 5-6595. A

House, 3-bdrm, split-level, built-ins, 1½ baths, dble. garage, $22,500 or rent. Redondo Bch., 374-2433. A

House Trailer, 28′, comp. furn., $300. Inglewood, OR 7-0993. A

Lot, approx. 1/3 acre, at Golden Shores in Ariz. along Colorado River, near boat landing, streets in, $500 dn., $29 mo., $2000. Burbank, 845-3363. A

Boat, 15′ Glaspar, 35 hp Evinrude, conv. top, elec. starter & many extras, $695. Redondo Bch., FR 8-2609. A

Ford Galaxie 500, 1964 conv., 300 hp T-Bird eng., r/h, p/s, about 15,000 miles, $2195. Thousand Oaks, 495-6055. A

Ford Country Squire, 1955, r/h, $250. Manhattan Bch., FR 4-5028. A

Air Cooler, 26″x17″x18″, water circulating-type, 3-spds., used once, $50. Rolling Hills Ests., FR 5-8778. A

Organ, Baldwin model 40, Orga-Sonic, percussion added, Philippine mahogany w/matching bench, $695. Redondo Bch., FR 5-3914.

Minnie Bike, 1965 model, Taquito, $110. Long Bch., 424-5992. A

Chair Set, med. wing back, white brocade, 1-yr-old, $50. L.A., 670-8926. A

SCUBA diving gear, single 71 cu. ft. tank, dble. hose regulator w/reserve, ⅛″ full wet suits, $40. Long Bch., 439-4618. A

Chevrolet, 1956 4-dr., V-8, auto. trans., avail. Sept. 27, $350. Box 1503. A

Sunbeam Alpine, 1962, wire wheels, good top & paint, $1150. Compton, 327-8226. A

Studebaker, Power Hawk, 1956, 4-barrel carb., p/s, p/b, new Gabriel shocks, r/h, auto. trans., $295. Hawthorne, OS 6-3388. A

Stereo Hi-Fi Components, AM/FM tuner, dual amplifier & preamps, 4 speakers, turntable, $66. Hawthorne, 676-0418. A

Austin Healey, 1955, ISKI racing cams, $795. P. V. Ests., FR 5-4294. A

Vacuum Cleaner, Eureka Empress, 3-mos-old, carrying case for all attachments, $90. Culver City, 836-4934. A

Home, 2 blks. to beach & stores, knotty cedar paneled, built-ins, completely redec., partially furn., patio & sundeck, redwood fence, fireplace, 2-bdrm., bath, 20′ Owens w/75 hp Evinrude inc., $32,000; extra bedroom & bath added for $34,000. P. V., 377-8259. A

Surfboard, 8′11″ Bing, $75. Manhattan Bch., 372-6603. A

Mattress & box spring, matched dble. bed size, Sears Seraform, 2-yrs-old, $35. L.A., EX 8-8805. A

Bicycle, girl's 24″ w/basket, $15. Rolling Hills Ests., FR 8-5175. A

House, attached dble. gar., fireplace, beam ceiling, on 2 lots, waterfall & fishponds, fenced, $19,500. Manhattan Bch., 374-5835.

Pontiac, 1964 Catalina conv., r/h, auto. trans., $2495. Santa Monica, 393-7464. A

Acreage, 100 acres, in Lanfair Valley near Colorado River, Joshua trees, potential alfalfa land, near projected Barstow to Needles Fwy., photos on request. $70 acre. L.A., 754-4384. A

Wanted to Buy

Shopsmith, all purpose machine tool. L.A., 478-5440. B

Gun, over & under, .22 mag./20 ga. Hollywood, HO 5-1380. B

Bicycle, ladies', reasonable. Torrance, FR 5-4312. B

FREE (To Be Given Away)

Kittens, 6-wks-old, black & white & grey & white. Inglewood, PL 6-2314. D

Pups, German shepherd, 4 females, 4 males. Box 1504. D

Kittens, pure white, 2 males, 1 female, 7-wks-old. Redondo Bch., FR 5-5310. D

Rentals Offered

Apt, large 3-bdrm, furn. or unfurn., children OK, enclosed gar. avail., close to schools & shopping. $115-$135. Eastview, TE 1-3737. E

Cabins, Lake Gregory & Crestline, sleeps 6, $25 weekends; $60 wk. Venice, EX 1-2040.

Apt, furn. deluxe 2-bdrm, 2 baths, fireplace, free hot water, ground floor, near Norair, $160 mo. Hawthorne, 679-1358. E

Apt, 2-bdrm, 1150 sq. ft., 1¾ baths, pool, rec. room, shuffle board court, furn. & unfurn., $130 mo. & up. Torrance, DA 9-1413.

Bachelor Apt, pvt. beach, 5 minutes from Nortronics Palos Verdes, $85 mo. Portuguese Bend, 377-8444. E

Apt, 1-bdrm., unfurn., lge. closets, pvt. patio, laundry rm., carport, adults, $78.50. Gardena, DA 9-9195. E

Apt, 1-bdrm, deluxe, built-ins & pool, $95 mo. Redondo Bch., 376-2117. E

Apt, 2-bdrm., unfurn., garage, w/light duties, $100 mo. Inglewood, 677-5705. E

Apt, walking distance of Northrop, 2-bdrm., 2-bath, lge. exec.-type, closed gar., $125. Hawthorne, 676-9620. E

Apt, air cond., 1-bdrm., 20 min. to Norair, $95 unfurn., $105 furn. Malibu, 391-7781. E

Apt. 2-bdrm, lge, children OK, walk to Norair, closed play yard w/playground equip., $115 mo. Hawthorne, OS 5-6032. E

Duplex, 1-bdrm, fenced yard, garbage disp., $62.50 mo. Redondo Bch., 376-8545. E

Apt, 2-bdrm, 1½ bath, unfurn., lge. closets, child OK, 2 blocks to Norair, $115 mo. Hawthorne, 679-0622. E

Horse Barn w/4 stalls, ½ acre, hay storage, $50 mo. Long Bch., 433-0685. E

House, 3-bdrm, 1½-bath, lge. living rm. w/fire place, dble. garage, patio, bbq, fenced yard, $150 mo. Gardena, DA 9-6297. E

Apt, 1-bdrm, fully furn., free utilities, pool, $115. Hawthorne, OS 9-7123. E

Studio Apt, 2-bdrm., 2½ baths, deck, subterranean gar., adults, near San Diego Fwy., lease, $175. Inglewood, 373-1143. E

Rentals Wanted

Garage or storage room that could be used for storing tools & furniture in 1000 Oaks or Newbury Park area. Newbury Pk., 805-495-7413, 805-498-3473. F

Personals

Driving to Ohio Sept. 15, will take 1 or 2 riders, share expenses. Torrance, 378-8825.

Pilots wanted for flying club. Low cost flying in well-maintained, well-equipped planes. 2 Cessna 172's, 2 Beech Bonanza's, 1 Meyers 200A, $200 initiation fee & $14 mo. dues. Torrance, 324-2992. L

Share home w/2 working girls, has 2 baths, all-elec. kitchen. L.A., AX 2-6909. L

Leaving for Ohio on Sept. 15, will take 1 or 2 riders to share expenses. Torrance, 378-8825. L

For Sale or Trade

Home, 4-bdrm., 2-bath, in Antelope Valley, corner lot, $12,000 or trade for South Bay or Orange County property. Torrance, 378-5924. M

Acreage, 5 acres, Mojave Desert retreat w/small weekend cabin $3000 or trade for income property. P. V. Pen., 377-6434. M

Boat, 14′ Fleetcraft, Mk. 55A outbd., skiis, trailer, $450 or trade for motorcycle or piano. San Pedro, 547-1537. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:30 a.m. — 4:15 p.m.

Crenshaw & Vernon, Los Angeles. Prefer ride with girl. Simona B. Cosme, Norair, ext. 2306, 293-5762. 3

8 a.m. — 4:45 p.m.

Crenshaw & Compton Blvd., Gardena. Martha L. Elliott, Norair, ext. 1712, 679-0882. 5

La Brea & 64th Pl. or Eucalyptus & 64th Pl., Inglewood. Louise T. McCulloch, Norair, ext. 2042, 672-2434. 5

NORTHROP NEWS

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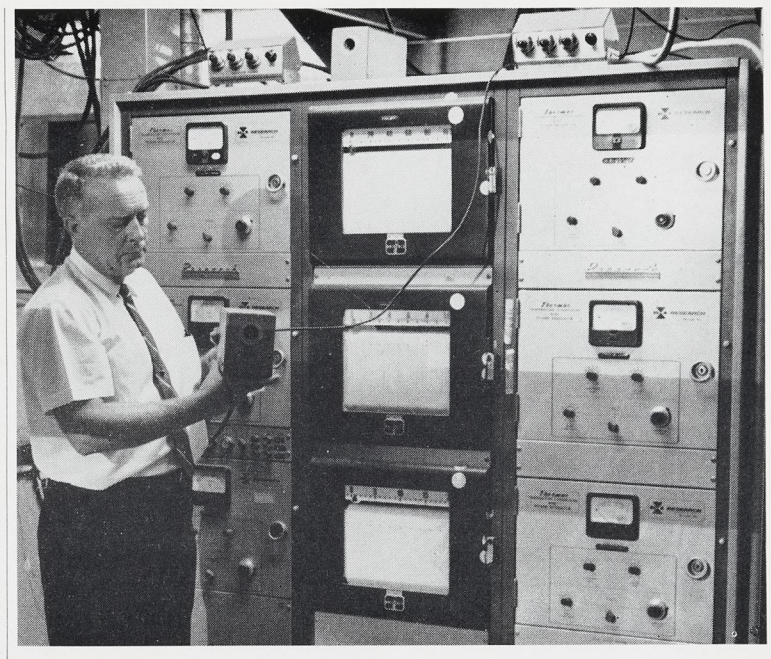


Special Projects Manager Joe Druliner checks out temperature control system which will be used to apply linear thermoplastic polyester resin.

CURTAINWALL: From an Office To a Major Contractor in 10 Years

(Continued from page 2)

ings of colored porcelain.

Protection of these materials from their environment has been one of the important tasks of the curtainwall construction industry. Currently used painted protective coatings have a life of up to three years before they must be repaired or refinished.

With the high cost of such refinishing in mind, Mr. McFarland had been looking for a coating material that would outperform those in use.

The result of his search is a plastic coating that PAC/WALL expects to guarantee for 10 years in any climate. The new substance is a linear polyester resin powder that is electrostatically sprayed on aluminum or steel and will be available in several colors.

In tests thus far, it has resisted a salt spray for more than 15,000 hours with no visible deterioration. It can expand or contract 1/8 inch per inch or flex around a two-inch mandrel without losing adhesion. It is highly resistant to abrasion or blows, inert to acids at up to 90° F. and has good dielectric qualities.

To prepare metals with this coating or others, PAC/WALL has a new 12,600 square foot finishing plant adjacent to its main building of 30,000 square feet.

The production line for the plastic coating will be fully in operation at the beginning of 1966. The material will be sprayed on in powder form at a temperature of 450° F. plus or minus 3 degrees. The process includes computerized controls, industrial radiometers as temperature sensors, and high intensity quartz lamp heaters developed at Norair's Manufacturing Research and Development by Bob Bridwell, manufacturing research specialist.

PAC/WALL maintains sales offices in San Francisco and Honolulu, and is represented by construction firms in the 11 western states; Alaska, Japan, Norway, France and Spain as well. The company joined Northrop as a two-thirds owned subsidiary in 1961 and became wholly-owned in 1962.

TICE: Former P-38 Pilot Recalls Landing in Japan a Week Early

(Continued from page 4)

from us and saluted smartly. Hall and I returned the salute and the officer in the center stepped forward and timidly extended his hand.

"I realized discretion was definitely the better part of valor at that point and shook hands with him. At this, all three of the Japanese smiled as if greatly relieved."

A small Japanese-English dictionary was produced and Col. Tice got the idea across that a larger plane was bringing in gasoline.

"They pointed out that this wasn't necessary," Col. Tice said. "They had gas. But when I took a whiff of it, it smelled like an old auto race track. It was then I learned the Japanese mixed castor oil with their gasoline."

About that time other soldiers and civilians "started coming out of the woodwork." Curious from the start, they realized that there was no danger of continued American-Japanese conflict — at least in Nittagahara. They arrived on foot and on bicycles. A few were even driving charcoal-burning automobiles.

The B-17 landed a few minutes later and the Japanese lent a hand transferring the fuel. They brought out a truck with a wobble pump and with the P-38 rolled close to the bomber, Japanese soldiers completed the work.

The B-17 crew brought out a case of C rations and gave the goodies to the children gathered around. The Japanese responded with a carton of sugar candy. Lt. Hawkins even started escorted tours of the B-17 interior.

"At this point it was a little difficult to believe that we had been fighting these people just a few days before," Col. Tice continued.

A few minutes later the three planes were able to take off successfully and return to base, concluding an episode like something out of a Hollywood movie script.

Col. Tice has been with Northrop International for 2½ years. He joined Northrop after 22 years in the Air Force.

For 2½ years he was Deputy for Test and Operations at the Air Force Flight Test Center, Edwards AFB. He also commanded the 65th Air Division, Air Defense System, based at Madrid, Spain.

His work with Northrop has taken him to the Middle East, including Saudi Arabia, and to Washington, D.C.

Nortronics Takes Over DDRR Work

Northrop's DDRR antenna program has been transferred from Ventura to Nortronics Division's Applied Research section.

The ring-shaped antenna, which can vary in diameter from a few inches to hundreds of feet, depending on transmission frequencies, is designed to eliminate problems connected with height, installation and mobility, while offering equal or better performance at all frequencies than the equivalent vertical tower which it replaces.

At Northrop Ventura, a prototype model was completed this summer under Army contract for fuse jamming application.

A truck mounted, low frequency jamming DDRR was also delivered to the Army this summer. Raised to a height of 40 feet by three hydraulic actuated cylinders, the antenna performs with an efficiency equal to or greatr than previously used 120-foot towers, according to Stan Boyle of the Northrop Ventura Marketing staff.

Another prototype was installed last year on the Pacific Missile Range tracking ship USS Wheeling. It is a six-foot high, 35-foot diameter unit with an efficiency approaching that of a 120-foot high tower.

DDRR (Directly Driven Resonant Radiator) has also been built small enough (¾ by 2¼ inches) to fit inside an astronaut or aircraft pilot helmet.

The DDRR was first developed for use on a Ventura target drone. Its performance in that application prompted further development which will continue at the Nortronics Applied Research section.

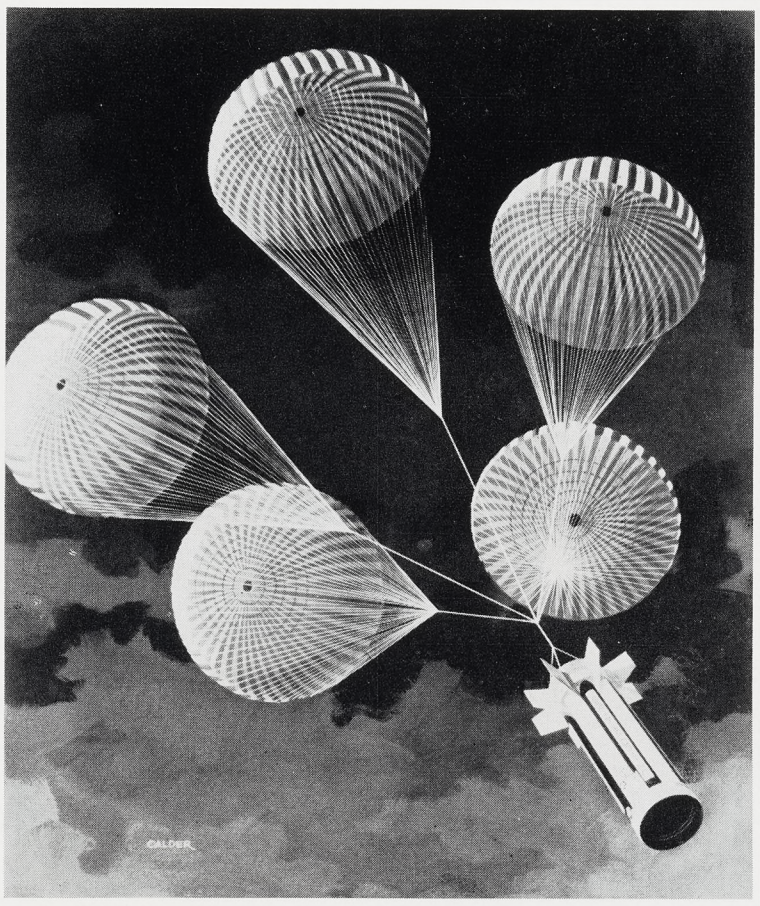
The DDRR program staff was originally a part of Applied Research at Northrop Ventura prior to the section's transfer this summer to Nortronics Division.

The program was transferred this month because "it is more in line with electromagnetic studies being conducted by the research group," a spokeman said.

GEMINI

(Continued from page 1)

this spacecraft is really a great tribute to an outfit that can make something that will work in an environment as that for all that time . . . This is a great relief to a person like myself, after an eight-day soak of that equipment and I think they deserve a tremendous amount of congratulations . . . "



REAL MONEY SAVERS—Artist has depicted how Northrop Ventura recovery system, made up of five 205-foot diameter Ringsail parachutes, could lower Saturn S1B booster to ground for possible re-use after flight. Also under study at Ventura is steerable parachute concept to land military boosters.

BOOSTERS: Ventura Studying Problems Associated With Recovery

(Continued from page 1)

Some of the technical problems and approaches required for booster recovery which may be a stimulus to a full-scale program, include:

—A recovery system within the weight limits prescribed by NASA.

—Re-entry stabilization and heat protection.

—A system which is within the state-of-the-art, thereby making maximum use of proven components and techniques.

—Supersonic parachute deceleration with less than 3 g's deceleration load (3 g's is the allowable limit) and terminal descent and landing at a low enough rate of descent to avoid damage to the vehicle.

—Use of radar and radio beacons to aid in location and recovery of the booster from the ocean.

—Methods of flotation and retrieval of the booster which, in the case of Saturn 1B, is complicated by the 21-foot diameter, 82-foot length of the vehicle but is made simpler by the 120-inch diameter of the Titan 3C solid fuel strap-ons.

The proposed Northrop recovery system normally includes a cluster of large final-tested parachutes, for example, five 205-foot diameter Ringsail parachutes for Saturn S1B for final landing. Supersonic deceleration is achieved by a single high Mach, heat resistant drogue chute.

Also under study at present is the use of steerable parachutes which not only could land at predetermined locations, but could land in the same direction as wave movement to reduce the possibility of impact damage.

"A steerable parachute which may be more desirable from the viewpoint of landing accuracy and lower weight and volume," Mr. Knacke said, "has been tested for the Titan and Minuteman class, but has not yet been designed for weights of the Saturn 1B class. This is, however, a goal for the foreseeable future."

It has been found feasible and practical by Northrop studies for steerable parachutes to be used in guiding spent military boosters of lesser weights to a safe dry-land area when fired from inland missile sites. This will avoid damage to life or property in the overflown areas.

"Again," Mr. Knacke emphasized, "it is not a question of recovery alone. But when NASA and DOD decide that the complete re-use cycle offers a decided cost advantage to the space program, we have the technical capability to provide a re-entry stabilization and parachute recovery system in a very short time."

Northrop To Develop Unique Lunar Drill

A unique and compact drill weighing less than 200 pounds with which future moon explorers may sample the lunar crust to depths in excess of 100 feet is under development at Northrop Space Laboratories.

Developmental efforts are being carried out under a $509,992 contract for National Aeronautics and Space Administration's (NASA) Marshall Space Flight Center at Huntsville, Alabama.

Westinghouse, holder of a similar contract, and NSL are to develop and manufacture engineering models. Eight firms had submitted bids for this work.

The final version of the lunar drill will become a key geological research tool. It will be employed in the Apollo Extension System for manned lunar exploration after the initial manned lunar landings.

Scientists believe that there have been few major changes in the lunar surface since its formation. Thus, undisturbed cores to be obtained by lunar explorers with this tool could provide important clues to the origin of the moon. This information may help resolve the many unknowns of the sublurain, including the existence of ice layers. Also, it may provide some indication as to how the solar system was formed.

Drilled holes could also be used for explosives for seismic research, for temperature and magnetometer probes, or for remote stations to be left on the moon for long duration.

NASA management of the lunar drill program is vested with the Marshall Space Flight Center, with John Bensko of the Research Projects Laboratory as principal investigator.

Northrop developmental efforts under this contract are centering at the NSL facility at Huntsville. Milton Beilock has been designated program manager with Sheldon O. Bresin as project engineer.

European Posts Go To Key Executives

New assignments for two key Northrop Corporation executives in Europe have been announced by Thomas V. Jones, Northrop president and chairman.

Geoffrey Parsons, who has been vice president and manager of European Operations, has been named vice president and European representative. He will be based in Paris, and will report directly to Glenn R. Lord, Corporate vice-president - Marketing, and will perform specific assignments for the company's top management.

Gwynn Robinson, who has been an executive of Northrop International at Beverly Hills, has been appointed to succeed Mr. Parsons as vice president and manager of European Operations.

He will be in charge of Northrop's Paris office and of all Northrop International operations in Europe, North Africa and the Middle East. He will report to General P. W. Timberlake, Corporate vice president-Northrop International.

CAFETERIA

(Continued from page 1)

gallons of soup daily. On Wednesdays, Prime Rib Day, about 150 pounds of beef is required. If meat balls are on the menu, about 60 pounds of ground meat go in the back door of the kitchen and out the other side through the food warmers.

While all this is going on, the dishwashing area is handling about 10,000 pieces daily, washing at about 180 degrees and rinsing at almost boiling temperature.

And what are Administrator Wilson and Chef Armand doing while lunch is being served? Well, by this time the hard part of today's preparations are done and already the germ of an idea for tomorrow's work is beginning to form in their heads.

NSL WILL EXPAND HUNTSVILLE SITE

Northrop Space Laboratories will build a 20,000 square foot addition to its engineering and scientific laboratories at Huntsville, Alabama, with construction scheduled to start within the next 60 days.

The addition will provide for an anticipated increase during the next 18 months in personnel assigned to scientific and engineering analysis programs being conducted for Marshall Space Flight Center and the Army Missile Command. It will include laboratory facilities in support of the engineering effort.

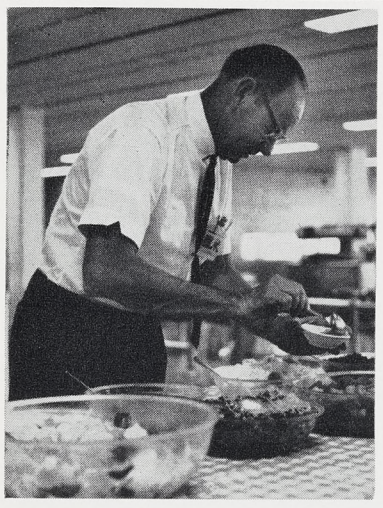
Total covered area occupied by NSL engineering and scientific personnel at Huntsville will be increased to 48,000 square feet with the new structure.

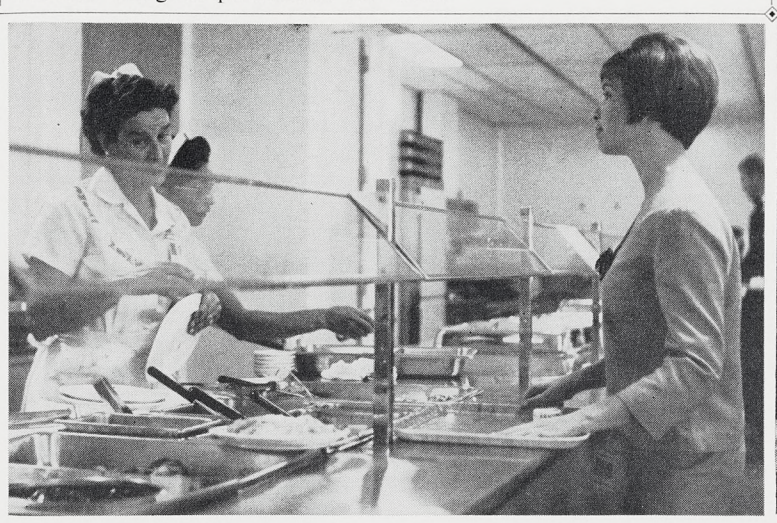
'Hearst Castle' Tour Set By NRC

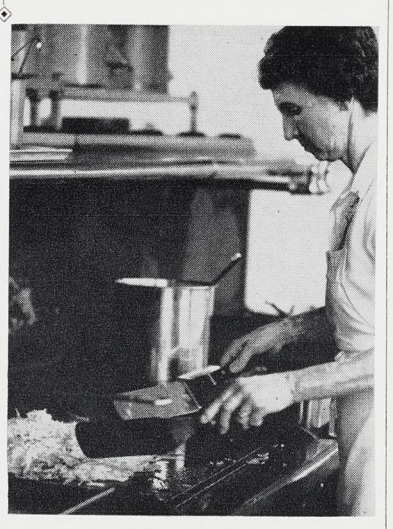
Another first will be added to popular all-Northrop group tours sponsored by combined NRC effort October 9 and 10 with an initial visit to the famed Hearst Castle at San Simeon.

Plans call for a Hawthorne departure at 9 a.m. on Saturday, October 9, lunch at the Andersen's Split Pea Restaurant at Buellton, a two-hour shopping tour of the Danish village of Solvang and late afternoon check-in at the Golden Tree Lodge, Morro Bay. Dining, dancing and entertainment follows that evening.

The total cost per person is $18.75 and includes all transportation, lodging and tour costs. Meals are not included.







Patrons of cafeteria may have major decision to make (left photo) when staff sets up do-it-yourself salad table. "Let's see, will it be garbanzas or pickled beets, or garbanzas and pickled beets, or tossed green salad?" In center photo, pulchritudinous patron utilizes Ventura cafeteria's scramble system to avoid standing in line for her food. Scramble system can also be applied to hashed brown potatoes (right photo) which require frequent turning to cook.

$19 Million Reduction in Costs Reported to DOD

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California Vol. 23, No. 16 September 22, 1965

The Picnic With the Big Difference

When you get right down to it, there's one giant difference between picnics.

At nearly all of them you can depend on hot dogs and hamburgers with mustard and relish, washed down by chilled soft drinks, preceded by popcorn and followed by ice cream.

There are lots of games for the kids. Some of the younger set will be playing the old perennials for the first time, and some of them will be giving the newcomers pointers on how a three-legged race or sack race should be run, or how to get the most down the fastest in the watermelon eating contest. There will even be pony rides.

It's always baseball or horseshoes for the adults, with maybe a few variations like swimming, badminton, volleyball, table tennis, checkers, cards or dancing.

But one big difference between picnics is people.

A good picnic includes people who work together, and their families and friends and neighbors. They have a chance to relax together and get better acquainted.

And that, with a few variations, is what's going to happen Saturday for the people who work at Northrop Ventura.

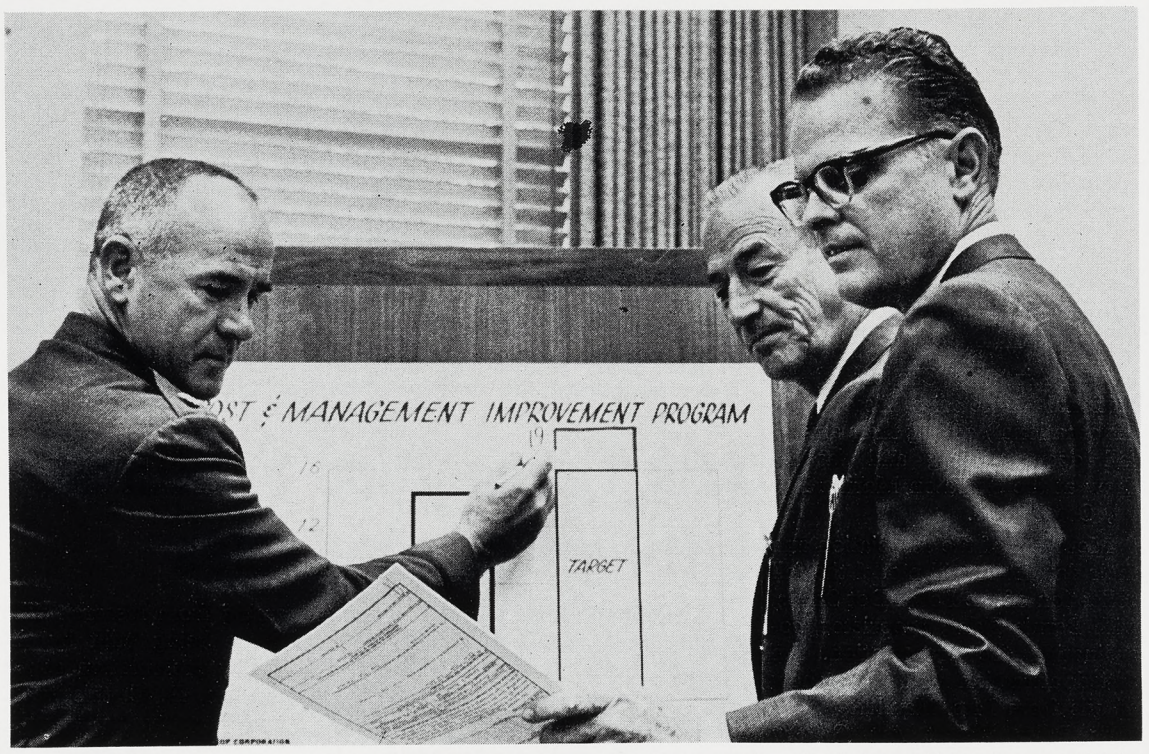
The picnic opens officially September 25, 10:30 a.m. at Vasa Park on Triunfo Canyon Road near Cornell Corners.

You can expect all the things expected of picnics plus a few added attractions like a puppet show, a clown, a stilt-walking sheriff from the Old West, a magic show, performing monkeys and rides for the kids.

Any number of games and contests will result in prizes to picnickers, and there will be door prizes as well.

Casual dress is recommended, for example, capris and low heels for the women. If you plan to swim, bring your bathing suit and towel.

(See PICNIC, Page 6)



WAY OVER THE TOP—Lieutenant Colonel Rufus K. Keeling (left), Northrop AFPR, marks chart to show Northrop's $19 million savings have exceeded $16 million goal in DOD contractor cost reduction program. Reading off 1965 fiscal year figures are Kenneth W. Hornor (right), Corporate CMIP coordinator, and James M. Hill, AFPR chief of Contract Administration. Savings are 119 percent of year's objective and represent $1300 for each Northrop employee.

Art of Encapsulation Is Advanced In Thermo-Bonding's Potting Room

Anyone who thinks Northrop Ventura space recovery systems are all parachutes should stop in and see Glenn Estes of Manufacturing's Thermo-Bonding section. He'll show you an electronics package that is so indestructible that it was a major accomplishment to develop a technique for repairing it.

Mr. Estes

Recently qualified by Northrop Ventura, the sequence controller subsystem is an unusual electronic brain.

It must withstand the effects of blastoff, prolonged exposure to the space environment and shock of re-entry deceleration on its intricate circuitry. To do so it is potted in plastic—and with a technique that advances the state-of-the-art.

The subsystem is composed of two sequence controllers, but each is potted, or encapsulated, separately with crossover circuitry.

After assembly and careful inspection, the controller is heated along with a molding fixture built around it. It is put in a vacuum chamber for evacuation of air, while the encapsulating compound (a plastic material) and catalyst are heated, weighed to exact amounts and mixed.

The compound and catalyst are poured into a vacuum chamber to remove all bubbles and fed by remote control directly into the sequence controller mold.

The controller is removed, wrapped in insulating material, placed in a temperature chamber, and cured for 24 hours through various temperature levels.

Final inspection is next. Excess compound in the pouring hole of the mold is sawed off and used as a sample for each controller and is tested for hardness and other characteristics.

The sequence controllers have performed to perfection in all test launches to date at White Sands, New Mexico. Later this year, the first launch from Cape Kennedy atop a Saturn booster is scheduled.

Northrop's recovery system for Apollo is designed to function under two main conditions—normal re-entry and aborted flight either at the launch pad or at high altitudes. The controller automatically senses which deployment sequence to initiate depending on the conditions.

During normal re-entry, the controller directs the following sequence of events:

—At 25,000 feet, a high-altitude barometric switch closes, which initiates ejection of the spacecraft's apex cover and exposes the recovery system to the atmosphere.

(See CONTROLLER, Page 6)

Photos on page 3

CMIP TOPS GOAL FOR FISCAL '65

Continuing its participation in the Department of Defense contractor cost reduction program, Northrop surpassed its $16 million goal for fiscal 1965 with net savings of more than $19 million, Thomas V. Jones, chairman and president, announced this week.

"Our record this year is particularly noteworthy," Mr. Jones said, "in that it resulted from 1343 separate cost improvement actions."

Mr. Jones pointed out also that the total of $19,103,621 in savings equals a cost reduction of $1300 per employee. The amount saved is 119 percent of the year's objective, $16,010,000.

Established in August 1963, Northrop's Cost and Management Improvement Program (CMIP) became part of the DOD nationwide contractors cost reduction effort initiated during 1964.

Savings during 1963 amounted to $22 million, and last year the Corporation logged more than $14 million in cost reduction.

Northrop has also accepted an invitation to join a similar program sponsored by the National Aeronautics and Space Administration.

CMIP is one of the important responsibilities of Richard R. Nolan, senior vice president—Manufacturing and Administration. He shares this responsibility with the general managers of the operating divisions.

Indicative of the importance of this program to the acquisition of new business is this policy statement quoted by Mr. Nolan from the official guidelines defining the Department of Defense cost reduction program:

"In making future source selections and in determining profit and fee rates on negotiated contracts where cost analyses are obtained, the Department of Defense will take into account the nature and effectiveness of a contractor's cost reduction program."

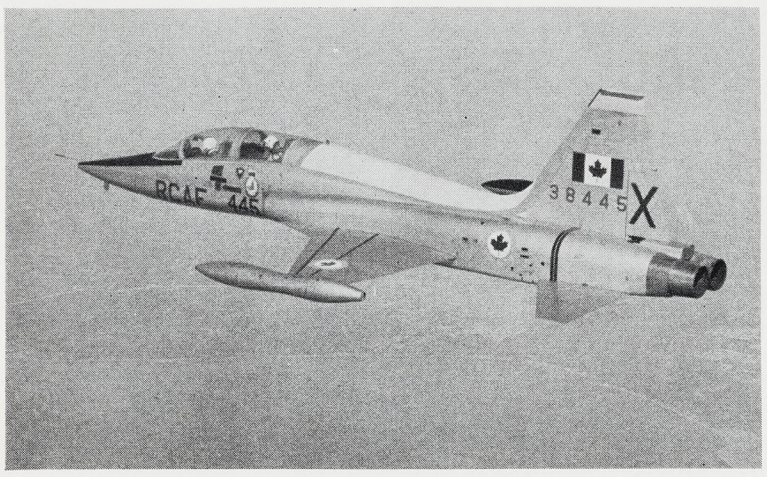
(See CMIP, Page 6)

F-5 SQUADRON TO SEE COMBAT IN VIETNAM

Another step toward U.S. Air Force employment of Northrop F-5 Tactical Fighters was taken last week by Secretary of Defense Robert S. McNamara, when he ordered that 12 F-5s be sent to Vietnam.

The purpose of the mission is to obtain in combat more information to be used in developing tactical air concepts, procedures, tactics and techniques for employment of F-5's in combat.

The F-5s will be flown in Vietnam by pilots from the 4503rd Tactical Fighter Squadron who now are in training for the program at Williams Air Force Base, Arizona.



F-5B WITH RCAF MARKINGS OVER CANADA.

100,000 View Northrop F-5 On First Canadian Tour

Northrop-built F-5 tactical fighters made their initial appearance in Canadian skies in the past month wearing the insignia of the Royal Canadian Air Force (RCAF).

In a two-week visit the two F-5's carried out some 57 demonstration flights and were seen by more than 100,000 people.

Canada has announced it will procure 125 of the aircraft to be built in Canada under a licensing agreement. The Canadian version will be designated the CF-5. (Northrop NEWS, July 28, 1965).

Northrop's leased F-5B was utilized for a majority of the demonstration flights. Also flown and viewed in static display was the advanced F-5 outfitted with the more powerful J-85-15 engines, takeoff doors and a two-position nose gear.

In their Canadian visit, the F-5s called at RCAF stations Cold Lake, Uplands, Trenton, Winnipeg, Ottawa and Toronto. At the latter the F-5 was a key static display during the Canadian National Exhibition. A special ramp-like structure over the wing made it possible for visitors to look into the cockpit area. Three RCAF teams were kept busy answering questions on the sleek F-5.

ORDAP Director Earns High German Honors

The Federal Republic of Germany last week awarded to James L. Taylor of Northrop Corporation the Commander's Cross of the Order of Merit in a presentation ceremony at the German Embassy in Washington, D.C. One of the highest awards the government can bestow on foreign citizens for exceptional service to the nation, the Commander's Cross was presented by Minister Dr. Herbert Freiherr Von Stackelberg.

Mr. Taylor is director of Northrop's Organization for Development Assistance Program (ORDAP).

The Foreign Ministry of Germany proposed the award in recognition of Mr. Taylor's leadership and contributions in establishing a German operations research capability in support of Germany's defense planning. Northrop has been under contract to the Federal Republic of Germany for this assistance since 1961 and the program extends until 1966.

Studies performed during the period by the German and American scientists under Mr. Taylor's direction were cited as a major contribution to the joint U.S.-German vertical takeoff and landing (VTOL) aircraft development program.

Concurrently with the study effort, the Northrop group provided training in operations research and systems analysis to the German aerospace scientists and assisted in defining defense system concepts for Germany during the 1970's.

Established by Mr. Taylor in 1960, this program makes available to free world countries Northrop's extensive experience in operations research and systems analysis and the application of management science to problems relating to military planning, national development and industrial operations.

Northrop operations research teams normally are stationed in the host country for a period of two to five years and work under the direction of designated host country agencies and management. The Northrop teams conduct planning research studies and furnish necessary management support concurrently with the training and leadership development of assigned personnel of the host country.

Following Mr. Taylor's return to the U.S. from Germany in August 1964, major effort has been applied to the establishment of Northrop development research assistance programs in support of national development in several countries in Europe, Africa and Latin America.

Secretaries to Host Wives of Bosses

Bosses' wives will be honored by the Airborne Chapter of the National Secretaries Association (International) during their annual fall open meeting and fashion show at the Sheraton Marina Hotel, October 14.

Members of the association and their daughters will model the fall collection of the Polka Dot Shops, with Bernie Sklar, proprietor, coordinating the presentation. An added attraction will be a show of oils from Mrs. Harriette Wagner's Palm Desert Art Gallery featuring autumn subjects.

Proceeds of the meeting will be donated to the NSA Home Trust Fund, Marianne Weltman, Airborne president and a secretary in the Norair Marketing department, reports.

The arrangement committee for the open meeting includes several Northrop women: Miss Weltman; Pat Noble of Manufacturing Research and Development, Norair; Marge Stevens, Corporate Public Relations; and Mattie Lee Sherburne, Flight Operations, Norair.

Reservations may be obtained by contacting Mrs. Noble at Norair, OS 5-4611, extension 1791; Mrs. Stevens, CR 4-8061.

Disneyland Night Open to Northrop

Arrangements have been made for Northrop personnel to participate in the Association of the United States Army Disneyland night Friday, October 22, at the associate rate of $3.75 a person for admission and unlimited use of Disneyland attractions.

Personnel offices will have AUSA Disneyland tickets available on a first-come basis.

NORTHROP NEWS

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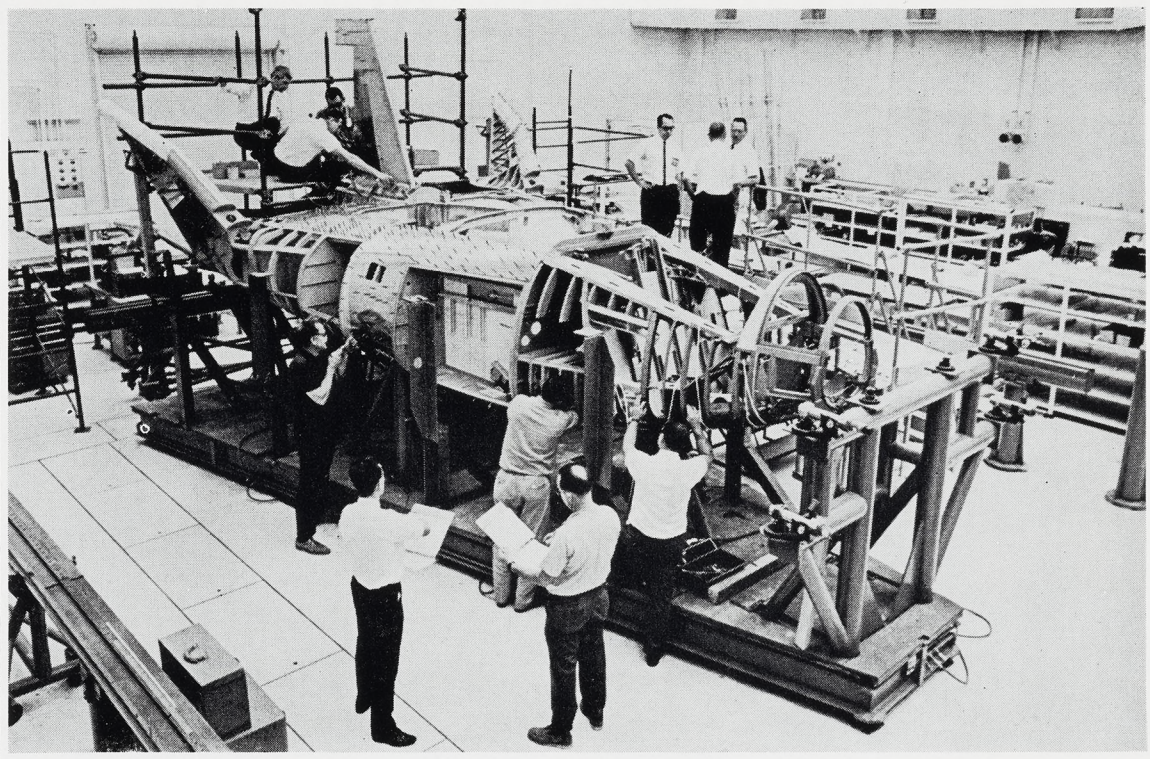


RAPIDLY TAKING SHAPE — HL-10 lifting body vehicle is shown approximately half complete at Northrop Norair. Tri-finned vehicle is second of two lifting bodies to be built by Northrop for NASA research program. First vehicle, the M2-F2, was delivered in June and has completed extensive wind tunnel test program.

AFA Convention Features Lifting Body Vehicles

Future applications to space travel, stemming from research with manned wingless lifting bodies, such as those being built by the Northrop Corporation, are featured in a display presentation at the Air Force Association convention in Washington, D. C. this week.

The latest such vehicle, designated HL-10, is being produced for the National Aeronautics and Space Administration by Northrop Norair. Construction of the tri-finned lifting body is on schedule and is approximately half completed. This will be the second such craft to be built for NASA by Northrop this year.

The experimental craft is being constructed in the shape of a half-cone, as was the Northrop-built M2-F2 lifting body delivered to the NASA Flight Research Center, Edwards, California, on June 15 of this year under the same contract. These are the first two all-metal lifting bodies ever built.

The M2-F2 has already undergone full-scale NASA wind tunnel tests, and flights are expected to begin this fall. The vehicles are designed for manned flight within the earth's atmosphere.

"By making maximum utilization of M-2 experience, and using common parts and concepts as far as possible, Northrop has reduced the engineering hours and compressed the manufacturing schedule of the HL-10," L. W. Klauer, project chief of engineering, said during the AFA gathering.

Present research by NASA on half-cone lifting bodies, Mr. Klauer stated, is predicted to lead to such developments as vehicles for space station resupply, space rescue, inspection/interception, command support/observation post and reconnaissance. Both the M2-F2 and the HL-10 will be capable of maneuvering from great altitudes and of landing on selected sites within a 1000-mile lateral range.

In discussing manned lifting body experimental activities, Mr. Klauer pointed out that such programs as the U. S. Air Force SV-5 lifting body shape are anticipated to require vehicles quite similar to the HL-10 and M2-F2. The SV-5 shape has been developed by the Air Force for maneuverable entry mission requirements. A future manned vehicle for subsonic and supersonic flight tests of terminal approach and landing performance is expected to be very similar to the M2-F2 and HL-10 in design and structure.

Another concept developed from these basic designs, described by Mr. Klauer, will be for a lifting body pilot trainer, in anticipation of increasing numbers of this type of vehicle being used in the future.

In addition to producing the HL-10 and M2-F2 vehicles, Northrop is currently completing a six-month NASA contract involving preliminary design feasibility studies of a manned lifting body shuttle vehicle concept. The contract is for basic research, with no vehicle construction involved.

(See LIFTING BODY, Page 5)

PROPOSED IN PARIS

Automating Aircraft Ground Support

Aircraft maintenance men of the near future may be able to find specific trouble spots in a matter of seconds by putting on earphones and listening to a tape recording.

This reduction in aircraft turnaround time is one of many improvements to flight readiness and safety for high performance aircraft made possible by a DATICO system developed by Northrop Nortronics Automation Systems section at Anaheim.

The system was described by Burl Ervin in Paris this month at a symposium sponsored by NATO's Advisory Group for Aeronautical Research and Development (AGARD). The paper was co-authored by W. R. Peterson, director of the Automation Systems section.

The integrated systems concept covers all levels of aircraft support: in-flight, flight-line, base and depot. The concept is based on equipment which is either in existence or which is being developed by Northrop to satisfy similar requirements.

The report described a continuation of the total integrated system support concept which Northrop has developed and proven over a period of several years in support of weapon systems such as the Polaris missile.

The concept applies to all checkout and maintenance except such servicing activities as re-fueling and re-arming, Mr. Ervin said.

Speed up of flight line service is intertwined with equipment for in-flight system.

In describing the in-flight checkout function, Mr. Ervin referred to a two-fold mission: (1) Provide information to the pilot as a basis for in-flight action, including all conditions affecting flight safety; and (2) Provide a means of rapid, easily understood notification to the flight line of any post-mission corrective action required.

To service these requirements, Nortronics proposes a voice warning system (VWS) complete with a flight record section and in-

(See AUTOMATION, page 5)

MEETINGS

Fourteen From Northrop Have Roles in SAE Forum

Fourteen of Northrop's key engineering and manufacturing personnel will participate in the Society of Automotive Engineers' 1965 Aeronautic and Space Engineering and Manufacturing Meeting next month in Los Angeles.

Jack Mannion and Paul Jacobs of Norair are executive committee members for the two day Manufacturing Forum which gets under way October 4 at the Statler Hilton Hotel. Mr. Jacobs is formerly of Ventura Division.

Bernerd Gaiennie of Manufacturing Research and Development is chairman and organizer of a session on Advanced Techniques for Handling Manufacturing Technical Data, and Arthur F. Eskelin is session secretary. Jud Iler of Norair is co-chairman of a session on Casting Technologies for Advanced Materials.

Presenting papers to the Manufacturing Forum will be Don Rhea (Norair), A. S. Turner (Norair), Alfred P. Langlois (formerly of Northrop Ventura, now assigned to Norair), and William H. Meyer, jr. (Norair).

For the engineering portion of the meeting, October 6, 7 and 8, Jim Brust of Nortronics is chairman of a session on Shock and Vibration.

Dr. Eugene W. Emmerich, Dr. Richard L. Jones and E. D. Jacobs, all of Norair will present a paper on Aircraft Structures. Charles W. Eyres of Norair is chairman of the committee for planning, publicity and promotion.

The Society's reception and banquet will be held at 6:30 on October 6 and the awards luncheon is scheduled for noon, October 7.

* * *

J. Grant Macdonnell Symposium Chairman

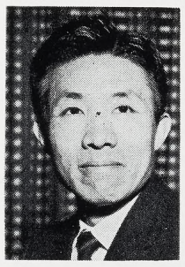
J. Grant Macdonnell, Northrop Corporation vice president and controller, will be co-chairman of a panel discussing cost of data during a three-day Data Management Symposium at the Beverly Hilton Hotel, September 28-30.

His military counterpart will be Brigadier General Wendell E. Carter, deputy chief of staff, Comptroller, Air Force Systems Command, Andrews AFB, Maryland.

Mr. Macdonnell, a 23-year Northrop veteran, was named to his present position in July. He was treasurer at Norair prior to his recent appointment.

Merit Award Won by NSL's Dr. Steve Hu

Dr. Steve S. Hu, director of Research and Analysis at the Northrop Space Laboratories Huntsville, Alabama facility has received the Northrop Space Laboratories Merit award for outstanding performance.



Dr. Hu

Dr. Hu received the award recently from Roy P. Jackson, vice president and assistant general manager—NSL, at the initial meeting of the new NSL-Huntsville Management Club.

Mr. Jackson pointed out Dr. Hu received the award for his leadership at the NSL-Huntsville facility and the eminence he has achieved as an authority in the field of aero-astrodynamics.

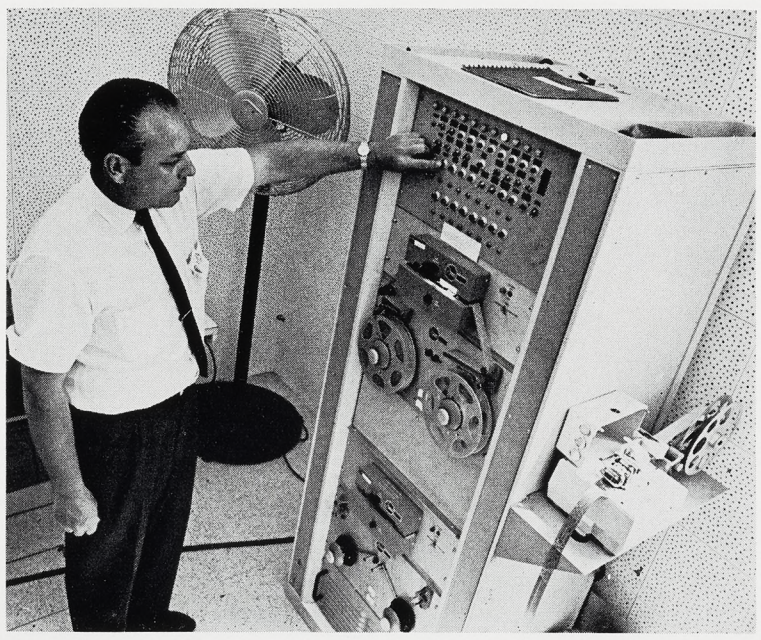
Dr. Hu is also a professor at the University of Alabama and through his dedication and professional excellence has helped to build the NSL-Huntsville Research and Analysis section technical capability from a staff of 13 persons in early 1963 to 118 at present. This group includes men with 18 Ph.D., 32 with M.A. and 51 with B.A. degrees.

Venturans Waltz Through Security Test With Ease

"Thinking About Security", a brief summary of security procedures, was recently published at Northrop Ventura as a means of providing reorientation to cleared employees. It will also be used to supplement the initial security indoctrination given new employees.

C. K. Simmers, division security officer, reports that more than 95 percent of Northrop Ventura employees passed the security test provided in the back of the booklet. "It was gratifying," he added, "that 65 percent of our people achieved a perfect score after reading the material."

Those who were unable to pass the test will have an additional opportunity to do so after further orientation by their supervisors.



TAPE CENTER—Bob Timboe, chief of Tape Center in Northrop Nortronics' Automation Systems Section, operates machine which checks duplicate computer tapes against the master. Tapes are operational instructions for automatic checkout equipment such as the DATICO system developed for U.S. Navy Polaris missile program by the Anaheim facility.

TRAVEL

TRAILERS, CAMPERS WILL GO SOUTH FOR MEXICAN 'FIESTA ON WHEELS'

Northrop owners of campers and trailers will head south over the long Thanksgiving holiday period for an unusual "Fiesta on Wheels" visit to Ensenada, Mexico.

Open to all Northrop families, the event is being sponsored by the NRC Trailer and Camper Club.

Reservations must be made well in advance through Personnel Activities offices at Northrop locations with an October 8 deadline.

At the time of making reservations a registration fee of $23 a vehicle must be paid. This is the total cost of the package visit and includes Mexican insurance, parking, shows, exhibitions, a barbecue, identification badges and souvenir booklet. Several options are open to participants at extra cost. Included are such events as Thanksgiving dinner, a fishing derby, and fashion show.

Dates of the "Fiesta on Wheels" are November 25 through 28.

Specific questions may be directed to NRC at Nortronics (Anaheim), ext. 1092.

* * *

NRC Slates Mexico Trip for Holidays

Through arrangements made by NRC Travel Clubs, a special group tour of Mexico is being planned for the yearend holiday period and is open to all Northrop families.

Plans call for departure December 24 via jet flight and return January 5. Stops will be made in Mexico City, Taxco, Acapulco and nearby points.

Total cost, which also includes many meals, lodging, air fare, etc., is $345 per person.

Arrangements are being handled through the Nortronics (Anaheim) Personnel Activities office, ext. 1092.

* * *

'Hearst Castle' Tour Set By NRC

Another first will be added to popular all-Northrop group tours sponsored by combined NRC effort October 9 and 10 with an initial visit to the famed Hearst Castle at San Simeon.

Plans call for a Hawthorne departure at 9 a.m. on Saturday, October 9, lunch at the Andersen's Split Pea Restaurant at Buellton, a two-hour shopping tour of the Danish village of Solvang and late afternoon check-in at the Golden Tree Lodge, Morro Bay. Dining, dancing and entertainment follows that evening.

The total cost per person is $18.75 and includes all transportation, lodging and tour costs. Meals are not included.

Importance of Software Stressed at Symposium

A week long symposium at Anaheim, prepared and hosted by Northrop Nortronics for U. S. Army Missile Command supervisory personnel has again emphasized that automation hardware is only as good as the software program supporting it.

High on the list of subjects discussed by 12 civilian engineers from the Missile Command, which is headquartered at Redstone Arsenal, Huntsville, Alabama, and engineers from Nortronics Automation Systems section was the Division's Test Oriented Software System (TOSS).

TOSS is at least two years ahead of the state-of-the-art in software support of automatic checkout equipment (ACE), section engineers said.

According to Bob Timboe, head of Automation Systems section's Tape Center at Anaheim, software has grown in five years from 10 percent of the cost of an ACE contract to as much as 50 percent today.

"In fact," he added, "software has become significant enough in automation projects that we are now being awarded contracts separate from the hardware to provide these services."

Loosely defined, software is everything that is necessary to make hardware work. In the case of automatic checkout equipment, the end result is operational test instructions in the form of computer tapes, but before the end product comes such activities as establishment of procedures and programs.

The greatest requirement for software support at Nortronics has been the Polaris missile program for which the Division has provided automatic checkout systems since 1958.

At the inception of the project, there were 12 systems supported, requiring 20 separate computer programs and 280 tapes. Today there are 84 systems supported, requiring 2187 computer programs and 12,000 tapes.

"If we had proceeded under the old system we would have 50 or more people in the Tape Center doing nothing but writing programs," Mr. Timboe said. "Using TOSS techniques we need only 15 and we have the best on-time delivery record in the business."

Nortronics is, in effect, "automating automation," in that the Division is using one computer to write programs for other computers.

Unique to the industry, the technique begins with an engineer describing what the checkout equipment must do. The description is translated into computer language and fed into an IBM 7040. Included in the printout are the procedures which the ACE system must follow.

Not only does it work where others have had their troubles, the technique has cut costs and allowed the Automation Systems section to post a perfect record for on-time deliveries.

Because the program is general rather than confined to a particular system, part of it can be used on numerous projects. Nortronics' own adaptation of computer languages is so simple that an engineer can prepare the preliminary test procedure in the program language.

Basic programs are so written that routine calculations and engineering activities are performed automatically, while anything that is unique about a system is readily identified for an engineer to handle manually.

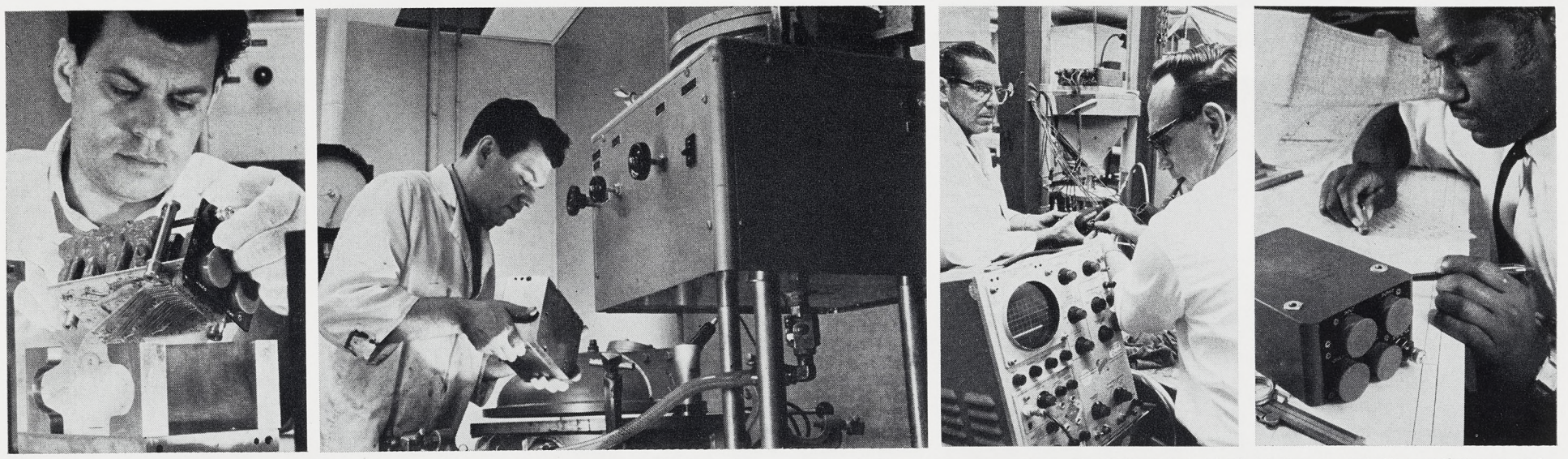
While TOSS is only one aspect of the over-all automatic checkout equipment program, it's early successes have prompted further investment to develop refinements to the system.

Harry Borowka New Chapter President

Harry Borowka of Norair's Perspective Drafting department has been elected president of the Southern California Alumni Association of Delta Phi Epsilon, national professional foreign service fraternity, for 1965-66.

Mr. Borowka, active in the fraternity alumni group since 1957, extended an invitation to Delta Phi Epsilon members at Northrop to contact him for information on alumni activities. He can be reached at Norair extension 1348 or EXbrook 5-5832 evenings.

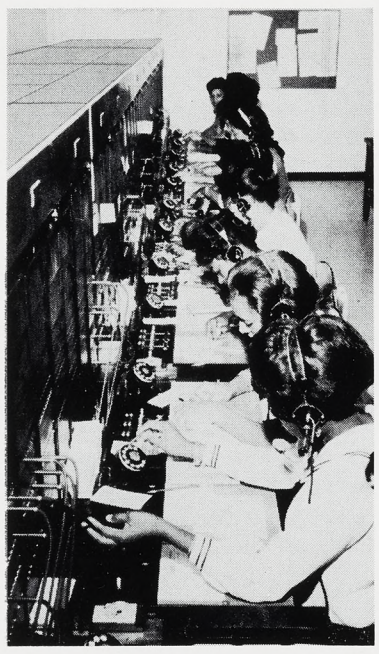
SEQUENCE CONTROLLER FOR APOLLO RECOVERY SYSTEM IS ADVANCEMENT OF STATE-OF-THE-ART



Sequence controller, which weighs only 6.25 pounds, was developed last year by Northrop Ventura as electronic brain of Apollo spacecraft recovery system. To meet reliability goals established by NASA, the Division developed an encapsulating technique, known as potting, which involves pouring a liquid chemical compound over the components in a mold. When the compound hardens (after a 24-hour period) and the mold is removed, the result is a virtually indestructible package. Frank Balaszi (photo at left) of Division's Thermo-Bonding section holds one of the units (it takes two to make a sequence controller subsystem) beside a "red point vacuum" machine, in which the encapsulating process takes place. Mr. Balaszi (second photo) has a controller partially covered by the viscous encapsulating compound. Prior to potting, the controller is rigidly inspected and tested (third photo) by Ed Mortude and Floyd Wendelberger. Moss Stribling (fourth photo) of Thermo-Bonding runs visual checkout of finished controller prior to full-scale acceptance testing by other sections of the Division. Reliability of the subsystem is in excess of NASA's minimum standards, allows for probability of one failure in 10 million landings. Apollo spacecraft will be recovered with a cluster of three 83-foot Ringsail parachutes.

Fortnight in Review

CAST FOR PARTS—Northrop Ventura Rod & Gun Club members have received permission to use the mall pool for casting with practice plugs. Chuck Simmers (left) and Joe Sliakis help Sue Lilley and Sue Saulsberry get into the swing of things in photo at left, then discover the gals have natural talent for distance and accuracy.



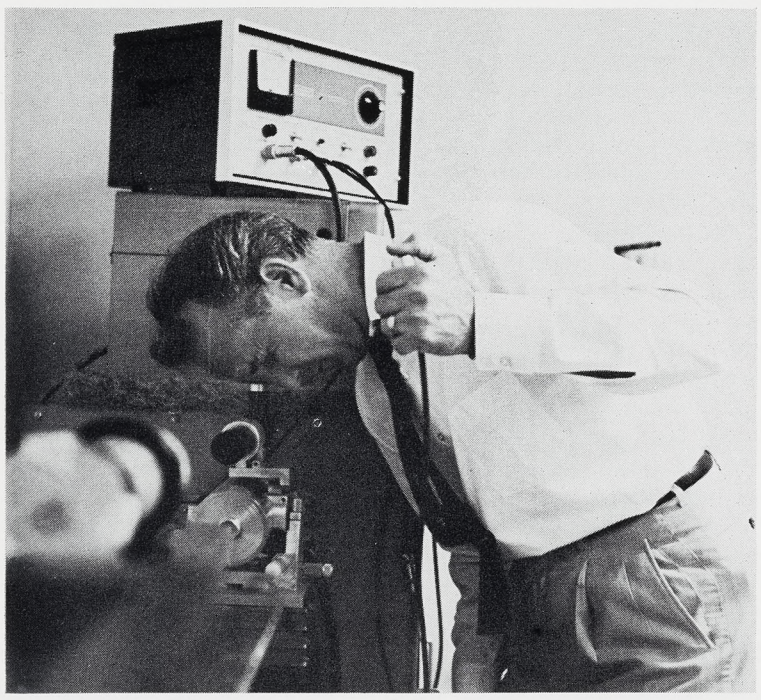
COMMUNICATIONS

Twelve-position switchboard at Freeport, Grand Bahama Island, is part of Bahamas-wide voice communications system being installed by Page Communications Engineers, subsidiary of Northrop. System is expected to play role in developing island's tourist industry.

At Palos Verdes, Northrop Nortronics has installed a new laser laboratory (below), including two ruby and one gas lasers. Engineer Joe Laborde warms up the two ruby lasers, which are designed to operate in tandem with each other.

WAR & PEACE

South Vietnam soldier stands guard (above) over antenna installed and maintained by field engineers of Northrop Page Communications, Inc., as part of Back Porch Communications system in South Vietnam. Page troposcatter systems are spotted throughout the Pacific as part of world-wide military communications link. Peaceful deployment of Northrop F-5 is being planned for Canada, and Northrop provided demonstration flights for Canadian pilots this month for first time (left photo). Bill Sweet (left) and Casey Finnegan (second from right) of Northrop brief Royal Canadian Air Force Wing Commander Amos Pudsey (far right) and test pilot E. R. Thompson. The F-5 also was on display during the Canadian National Exhibition at Toronto.



Initial meeting of the recently-organized NSL-Huntsville Management Club was held at Sheraton Motor Inn and featured talk by Roy P. Jackson, Norair vice president and assistant general manager—NSL. At head table (from left) are Jerry Ligocki, Dr. S. S. Hu, Dwight Shelor, Ted Taylor, A. Wallen, General J. A Barclay, Mr. Jackson, A. E. Blythe, Marlin Sloan and Milton Beilock.

AIR FORCE PILOTS BRIEF POPULAR TELEVISION HEROES ON FINE POINTS OF NORTHROP TRAINERS

In photo at left, Robert Lansing (in cockpit), featured actor last season on Twelve O'Clock High television series, is checked out on T-38 by Captain Joe Stroface, test pilot assigned to Manned Spacecraft Operations, Air Force Flight Test Center, Edwards Air Force Base. Mr. Lansing holds private pilot's license. At right, John Forsythe is briefed by Major Roy Boyd, F-5/T-38 officer in the Northrop Air Force Plant Representative's Office prior to shooting scenes for John Forsythe Show. The program premiered September 13 and included shots of Norair's Palmdale facility.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Camping Equip., 3-burner Coleman stove, ice chest, 2-mantle lantern, $25. Box 1601. A

Range, O'Keefe & Merritt, gas, chrome top & griddle, $50. Hawthorne, OS 5-2433. A

Tuner, Neisner AM-FM, $15. Hawthorne, OS 9-1550. A

Cemetery Plot, dble. internment, on a slope, all improved, El Sereno plot, Inglewood Park, $550. Inglewood, OR 2-8468. A

Pontiac, GTO, 1965, 4-spd., positrac., chrome rev. wheels, AM-FM w/revibrasonic, tripower, convt., $2700. Torrance, 370-3714. A

Air Conditioner, 10,500 BTU, 110 volts, 150 lbs., $150. Hollywood, HO 3-6327. A

Typewriter, IBM exec., elec., 12″ carriage, 5-yrs-old, used 6 mos., $350. La Mirada, 941-2551. A

Ford station wagon, 1958, r/h, stick V-8, o/drive, new eng., 10,000 miles, $395. Torrance, FA 8-6567. A

Wardrobe, complete, for little girl, sizes 5 & 6, $20. Hawthorne, OS 5-7965. A

Car Cooler, Allstate deluxe, blower model, $20 w/transformer, $25. L.A., OS 6-9855. A

Chrysler, 1957, 2-dr. h/top, good trans. & eng., orig. owner, $250. Hermosa, FR 6-1636.

Bunk Beds, guard rail, ladder, springs & box spring mattresses, $45. Torrance, 323-5740. A

Chevrolet, Impala, 1960, 421 cu. in. eng., 4-spd., Jardine headers, chrome rev. wheels, Caslers, $1500. Inglewood, 674-1847. A

Ford pickup, 1950, Olds eng., 3-spd. trans., $275. Torrance, 371-5916. A

Stereo Hi-Fi components, AM-FM tuner, dual amplifiers, dual preamps, 4 speakers, stereo turntable, $66. Hawthorne, 676-0418. A

Household furnishings, Danish modern, living & bdrm. set, 2-dr. refrigerator, sell sep. or $200. Gardena, OR 0-0415. A

Twin Bed Sets, 6, $25 ea. or $150. Gardena, 670-8284. A

Boat, 12′ fibreglass, w/7½ hp motor & trailer, $300. Hawthorne, OS 5-3866. A

Bar, 6′ by 4′, $100. Lakewood, ME 0-1364.

Comet, 1962 orig. owner, 4-dr., std. shift, r/h, $925. Fountain Valley, 847-0575. A

Sewing Machine, factory power, Wilcox & Gibbs S. M. Co., some attachments, $85. Torrance, 834-1378. A

Headboard, durable, $5. Gardena, 329-9484.

Lark, 1960, r/h, $275. Torrance, DA 3-1612.

Trailer, 16′ camping-type, sleeps 4, elec. brakes, ice box, stove, $350. Lawndale, OS 5-5483. A

Ford, station wagon, 1958, eng. recently o/hauled, r/h, w/s/w, $550. Rolling Hills, FR 5-5761. A

Judson Supercharger, newly rebuilt, fits all Triumph TR2-3 & 4, $75. Hawthorne, DA 9-8734. A

Plymouth Belvedere, 1957, convt., r/h, p/s, p/b, p/seat, $200. L.A., GR 7-1494. A

Piano, small console, w/bench, mahogany, made by Starr, $400. Torrance, 323-1698. A

Encyclopaedia Brittanica, 1955 junior edition, plus yearbooks to 1965, $30. P. V. Ests., FR 5-5097. A

Organ, Thomas electronic transistorized, Serenade, ebony, matching bench, 2 keyboards, 25′ pedals, Leslie speaker, plus 3 12″ speakers, many extras, $1500. Hawthorne, 679-4365. A

Motorcycle, 1965 Gilera, 202 super 1400 miles, 100 mpg., 20 h.p., extras, $650. Hawthorne, 679-5864. A

TV, 21″ RCA table model, new picture tube, $45. Cypress, 828-9075. A

House, lge. 3-bdrm., 2 baths, built-ins, extras, near school, $32,500. Rolling Hills Ests., FR 8-1420. A

House, 3-bdrm. & den, redecorated, $17,950. Inglewood, OR 4-0366. A

Mercury, 1964, Park Lane Marauder, 4-dr h/top, factory air cond., p/s, p/b, radio w/vibrasonic, $2500. Westchester, 645-7446.

MGA, 1959, 29,000 mi., r/h, $650. Hawthorne, OS 9-1632. A

House, 4-bdrm., built-ins, 4-yrs-old, will go FHA, $24,500. Torrance, DA 3-6018. La Habra, 714-871-3811. A

Acreage, lake frontage in No. Calif., terms, two 2½-acre parcels, $5750 parcel; two 5-acre parcels, $9500 parcel. L. A., 476-1635.

Refrigerator, Hotpoint, 75-lb. top freezer, $50. Torrance, DA 6-5457. A

Volkswagen, 1961, 2-dr., r/h, $1000. Lomita, 326-6145. A

Drapes, Beauti-pleat, 45 yds., covers 30′ at 84″ long, off-white, cotton boucle, $25. Torrance, DA 6-7996. A

SCUBA Regulator, U. S. Divers Calypso, single hose, $55. Torrance, 377-8535. A

Washer & gas dryer, Whirlpool Imperial, pink, matched set, $170. Inglewood, OR 4-7743. A

Bicycle, boy's 10-spd. Derailleur, $35. Hawthorne, 676-9731. A

For Sale

Corvair, Monza, 1964, 4-spd., $1425. Torrance, 371-8245. A

Pontiac, Bonneville, 1959, $750. Torrance, 378-8825. A

Motorcycle, Allstate Mo-Ped lightweight, 707 miles, $125. Huntington Bch., 714-962-2344.

Pups, boxer, AKC reg., champion backgrounds, $65 & up. Torrance, FR 8-4676. A

Transmission, 1955 to '65 Chevrolet 3-spd. w/Hurst linkage, $100. Gardena, DA 7-2029.

Bicycle, 10-spd. Derailleur, Italian-made, $40. Manhattan Bch., 372-6603. A

Ford, 1947, custom int., 15,000 miles, $300. Torrance, FR 8-1350. A

Refrigerator, Coldspot, 13.5 cu. ft., $50. Hawthorne, OS 5-1057. A

Chair, bucket-type, white, $15. Gardena, 679-1642. A

Darkroom Equipment, complete w/supplies, $175. Los Alamitos, GE 1-4233. A

Sofa Bed, love seat-size, conv., special fabric, $49. L.A., 645-3986. A

Coffee Table, round, w/2 stepdown tables, birch, Nev-a-Mar tops, $10. Orange, 637-0013.

Bicycle, boy's Schwinn Stingray, $15. Hawthorne, OS 5-0645. A

Wedding Ring Set, $50. L.A., 755-9158. A

Model A Ford, 1929, $250. El Segundo, EA 2-3420. A

Camper Windows, 2 18″x18″, 2 18″x56″ crank out-type, $25. L.A., 670-1304. A

Freezer, chest-type, 16 cu. ft., 500 lb. cap., 5-yr-old, $80. Redondo Bch., 376-1823. A

T-Bird, 1955, all powered, w/s/w, auto. floor shift, $1125. Inglewood, 673-0752. A

Platform Rocker, $20. Hawthorne, OS 5-2514.

Stove, O'Keefe & Merritt, gas, lge. oven, sep. broiler, storage drwr., $50. L.A., 755-8917. A

Boat, 15′ Glasspar, 35 hp Evinrude, conv. top, elec. starter & many extras, $695. Redondo Bch., FR 8-2609. A

Vacation Trailer, 1956, 15′ 8′x10′ awning side room, continental kit w/spare tire, other extras, sleeps 5, $750. Hawthorne, 679-7497. A

Minnie Bike, w/fenders & license, $125. P.V. Ests., FR 7-2294. A

Go-Kart, $60. Inglewood, PL 6-7681. A

Corvair Greenbier, 1961, r/h, 3-spd., 3-seats, $695. Inglewood, 673-2751. A

Bed, dble, extra long, $30. L.A., 472-6712.

TV, 21″ b&w, remote control unit, 1960 model, Scandia. walnut console, $75. Gardena, 323-8429. A

Trailer, custom teardrop, will sleep 3, fully equipped, $250. Garden Grove, 539-0670. A

Bar & 2 stools, $50. Inglewood, OR 4-0111.

Home, 3-bdrm., 1½ bath, 2-car gar., patio, fireplace, sep. laundry room, 5 avocado & 4 fruit trees, $24,950. Pico Rivera, 943-8187.

Pup, toy pomeranian, AKC reg., born Aug. 14, light tan, male, $125. Los Alamitos, GE 0-1952. A

Volvo, 1958, w/1959 eng., 3-spd., $325. Manhattan Bch., FR 2-0649. A

Tires, 2 tube-type, w/w, 710x15, $10. Gardena, DA 4-8853. A

Lot, single, Parkview, Inglewood Cemetery, $550 plus transfer fee, Torrance, TE 5-2128.

Table & 4 chairs, bronze, $25. Hawthorne, 679-5073. A

Renault Parts, complete rearend w/brake drums, head w/valves, water pump & fan, many extras, $50. Torrance, DA 6-5558. A

Wet Suit, including hood, sizes 40-42, fins, mask w/exhalation valve, $50. Torrance, 323-4257. A

Honda S-90, 1965, 2800 miles, take over pymts. of $24.50 mo., $400 w/insurance & interest. Lawndale, 679-9221. A

Corvair 95, 1964, Greenbrier, 23,000 miles, 4-spd., bucket seats, many extras, $1950. Hawthorne, 675-9557. A

Bedroom set, 2-yrs.-old, 9-drwr. dresser, chest of drwrs., 2 nite stands, dble. bed size mattress & box springs, $290. Lawndale, 676-3050. A

Luggage Rack, chrome, for station wagon, $15. Inglewood, PL 5-4497. A

Dinette Set w/6 chairs, blonde, $25. Torrance, FA 8-4243. A

Chevrolet, 1956 4-dr., V-8, auto. trans., $350. Box 1602. A

Drafting Machine, Bruning, 5-yrs-old, $60. Torrance, DA 4-0341. A

Exercycle, 2-spd. motor, $350. Brea, 529-3531. A

Austin Healey Sprite, 1959, head rests, AM radio, $850. Inglewood, 675-9540. A

Ford station wagon, 1955, Country Squire, $150. Manhattan Bch., 374-5028. A

Couch, & matching chair, 3, $100. Torrance. 834-2845. A

Horse, red sorrel gelding, $300. Torrance, DA 9-2016. A

Baby bottle sterilizer, Evenflo, electric, $5. Torrance, 371-8939. A

Home, near Northrop, 4-bdrm., 2-bath, near schools & shopping center, $32,650. Hawthorne, OS 5-4905. A

Pontiac, 1957, 4-dr. sedan, auto. trans., w/s/w, $350. Redondo Beach, 374-7416. A

Pups, Boston terriers, reg., 4 male, 2 female, 7-wks-old, $75. Yorba Linda, 528-5979.

Austin Healey Sprite, 1959, r/h, new tires & paint, $550. Manhattan Bch., 370-6472. A

Ford, 1957 4-dr. sedan, 6-cyl., auto. trans., completely o/hauled, $225. Hawthorne, 675-6788. A

Dinette table & 4 padded chairs, Formica & chrome, $25. Rolling Hills, 323-1626. A

Wanted to Buy

Bicycle, man's, 28″, 3-spd. in good condition. Torrance, 835-1031. B

Warren Hubs for Earley Wiley 4 W.D. jeep. Hawthorne, OS 9-6449. B

High chair, child's, reasonable. Inglewood, 677-9333. B

Sewing Machine, portable, elec., in good condition & very reasonable. Santa Monica, 393-7464. B

Lot or cabin, Crestline area, p.p. only. Inglewood, OR 7-8543. B

Pickup or panel truck, 1950-1954 Ford, Chevrolet, or GMC. Hermosa Bch., FR 2-3722. B

For Trade

Outboard Motor, 10 hp late model, trade for 7.5 & cash. Inglewood, OR 1-2058. C

Rentals Offered

Apt, 2-bdrm. utilities paid, $135. Inglewood, OR 2-0304. E

Apt, furn. single, elec. kitchen, tile shower, patio, gar., ½ blk. to beach, $90 mo., Redondo Bch., FR 5-8938. E

Studio Apt, 3-bdrm., 2-bath, unfurn., pvt. patio, closed gar., sound proofed, $175 mo. Torrance, FR 5-0867. E

House, 1 & 2 bdrm., lge., trash & water pd., no pets, $120 mo. Lawndale, 371-6775. E

House, 3-bdrm., family rm., 2-bath, 9-yrs-old, FA heat, garage, rear fenced yard, $200 mo. P. V., FR 7-6458. E

Apt, 2-bdrm, 2-bath, storage space in gar., washing facilities, $125 mo. Inglewood, 672-5798. E

Apt, 1 & 2-bdrm., closed gar., near schools, shopping & playgrounds, 10 min. to Nortronics P. V., $75-$125. Walteria, 375-2091, 375-9397. E

Cabin, Lake Gregory & Crestline, sleeps 6, $25 weekends, $60 wk. Venice, EX 1-2040. E

Apt, 1-bdrm., unfurn., on strand, ocean view, lge. deck, $225 mo. Manhattan Bch., FR 4-8842. E

Apt, 1-bdrm., unfurn., pvt. patio, gar., laundry room, lge. closets, near to transportation, adults only, $78.50. Gardena, DA 9-9195.

House, 3-bdrm., 1¾ baths, closed gar., fenced yard, water & lawn paid, near shopping, 8 min. to Norair, unfurn., $130 mo. L.A., PL 4-1964. E

Apt, 1-bdrm., furn., utilities paid, near Northrop, 1 person, $75; 2, $85. Lawndale, OS 5-9695. E

Apt, furn., deluxe 2-bdrm., 2 baths, fireplace, free hot water, ground floor, near Norair, $160. Hawthorne, 679-1358. E

Apt, 1-bdrm., single unit, pvt. patio & entrance, stove, refrig., adults, $115 mo., $110 w/lease. Inglewood, OR 7-9047. E

Apt, 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

Apt, 2-bdrm., unfurn., 10 min. to Norair, $100 mo. P.V. Ests., 376-5941. E

Rentals Wanted

Secretaries, 2, willing to share 4 bdrm. house. Hermosa Bch., 374-7109. F

Personals

My appreciation for your evidences of interest in my recovery while I was ill. L. H. WALTON. L

Need ride to vicinity of N.W. Montana in mid-December. Will share driving & expenses. Anaheim, 776-0849. L

We Wish to thank our friends for their sympathy & flowers during our bereavement. ROSE & LARRY KORN. L

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

6:45 a.m. — 3:30 p.m.

Downey & Del Amo, Lakewood. T. L. Reeve, Norair, ext. 1591, ME 0-1364. 10

7:30 a.m.—4:15 p.m.

Brookhurst & Warner, Santa Ana. J. P. Hewes, Norair, ext. 2597, 531-1942. 3

La Brea & Arbor Vitae, Inglewood. Need ride home only. Barbara J. Valpe, Mariposa, ext. 4186, OR 3-2740. 3

8 a.m. — 4:45 p.m.

Manchester & Airport Blvd., Los Angeles. D. J. Hall, Norair, ext. 2535, 645-6815. 5

Thousand Oaks. M. S. Shapiro, NSL, ext. 2853, 805-495-9601. 5

Peninsula Center & Grandview Area, Palos Verdes Peninsula. H. R. Welton, Norair, ext. 2171, 377-2101. 5

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Brookhurst & Warner, Santa Ana. J. P. Hewes, Norair, ext. 2597. 531-1942. 13

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Peninsula Center & Grandview Area, Palos Verdes Peninsula. H. R. Welton, Norair, ext. 2171, 377-2101. 15

PLEASANT SURPRISE

Q. C. Lampkins, Northrop Norair metal fitting mechanic, throws up hands in mock surprise as he receives five Suggestion Award checks (total: $110) from Foreman Pat Garrett (left) and General Foreman Ed Nolan. This was his first venture into Suggestion Award Program and he's followed up with four more currently being evaluated.

LIFTING BODY: Northrop Craft Featured in Washington Display

(Continued from page 2)

The HL-10 and M2-F2 are designed as forerunners of future vehicles to enter earth's atmosphere from outer space at orbital speeds. The two craft, built by Northrop, will be used for manned sub-orbital flight tests in the critical terminal approach and landing phase of entry flight. Vital knowledge of aerodynamic and controls performance, as well as pilot/vehicle compatibility, is expected to be gained from these flights.

While both the M-2 and HL-10 are half-cone shaped, with blunted noses and boat-tailed horizontal trailing edges, the primary differences in configuration are in their fins, cockpits, and body surfaces. The HL-10 has three fins compared to two for the M2-F2 and has its cockpit recessed to provide an unbroken body line, while the M2-F2 has a bubble-shaped canopy. The HL-10 is also flat on the bottom, whereas the M2-F2 is flat on the top.

Both the HL-10 and the M2-F2 will be launched from the wing of a B-52 airplane in X-15 fashion. They will be dropped at approximately 45,000 feet altitude and Mach 0.8 speed, to glide to conventional airplane-type landings. Both will utilize a special 22-foot long Northrop Norair adapter which will be attached to the existing X-15 launch pylon on the wing of the B-52.

The newest Northrop lifting body research vehicle is scheduled to be completed for delivery to NASA in January 1966, approximately seven months from the time initial fabrication work began.

AUTOMATION

(Continued from page 2)

flight performance measurement system with automatic decision-making capability.

While the primary function of the VWS is to warn pilots of malfunctions in aircraft performance, it also makes a recording of each malfunction which ground maintenance crews could listen to prior to servicing the aircraft.

Checkout equipment would be used at the base to relieve the flight-line of maintenance which requires more time than normally allotted to rapid turnaround.

Similar equipment would be installed at a depot to insure that articles sent to the base will perform for the established "between service" time span.

HACHTEN NAMED TO DIRECT PR EFFORT AT NORAIR

Richard A. Hachten has been appointed head of Public Relations for Northrop Corporation's Norair Division, Norman Warren, Corporate director of Public Relations and Advertising, announced. Mr. Hachten has served as assistant manager of Public Relations for Northrop Norair since last March and succeeds Donald R. Roberge who resigned to enter the field of education.

Ben H. Scarpero replaces Mr. Hachten as assistant.

Mr. Scarpero joined Northrop recently after completing 20 years of service with the USAF where he last held the position as director of Information for Hdq. 19th AF.

Mr. Hachten was Public Relations administrator for Hughes Aircraft Company for nearly four years. For approximately 12 years before that he was affiliated with Curtis Publishing Company. He is a graduate of the University of Southern California where he majored in journalism and is a member of Sigma Delta Chi, national honorary journalism fraternity.

Mr. Scarpero's last Air Force assignment was in the grade of major at Seymour Johnson AFB, North Carolina. He had also served in Air Force public assignments in Japan and Los Angeles. During a period following World War II, he was employed by the New Orleans Item and later the UPI in that city, as well as serving as director of Information for the New Orleans Port of Embarkation.

Mr. Scarpero is a graduate of Louisiana State University and is a member of the Aviation/Space Writers Association, the Wings of Club of New York, the Air Force Association, and Sigma Delta Chi.

Turkey Day Campaign Is Scheduled

It's turkey raffle time at Northrop Ventura and all you have to do to be eligible is turn in a single suggestion to the Employee Suggestion Award Committee.

Every suggestion turned in between October 4 and November 1 will be numbered and the holders of 35 to 40 of the numbers will receive a turkey in time to stuff it for Thanksgiving Day, November 25.

To make things even more interesting, there will be cash awards beyond the usual amounts for those suggestions put into practice, and from among those used a further prize will go to the best suggestion of the month.

If you want a crack at a free lunch in the Ventura cafeteria, turn in two or more suggestions during this special pre-Thanksgiving Day program. If your award number is drawn in the turkey event and you have more than one suggestion in the mill, you'll get the turkey plus a free meal.

Bill Gohr Retires Following 40-Year Aerospace Career

Bill Gohr, 64, senior engineer in the Design Engineering branch, left Northrop Ventura last Friday for retirement after almost 40 years in aircraft and aerospace engineering.

Two days later he was in Munich, Germany, where he will spend the winter. The summer months will take him to a meeting with former co-workers in Locarno, Switzerland, on Lake Maggiore. He plans to spend up to a year in Europe with his wife, Elsie.

Mr. Gohr came to the United States from his native Germany in 1925. In 1928 he joined Bellanca Aircraft, producers of the Pacemaker, first airplane to carry passengers across the Atlantic.

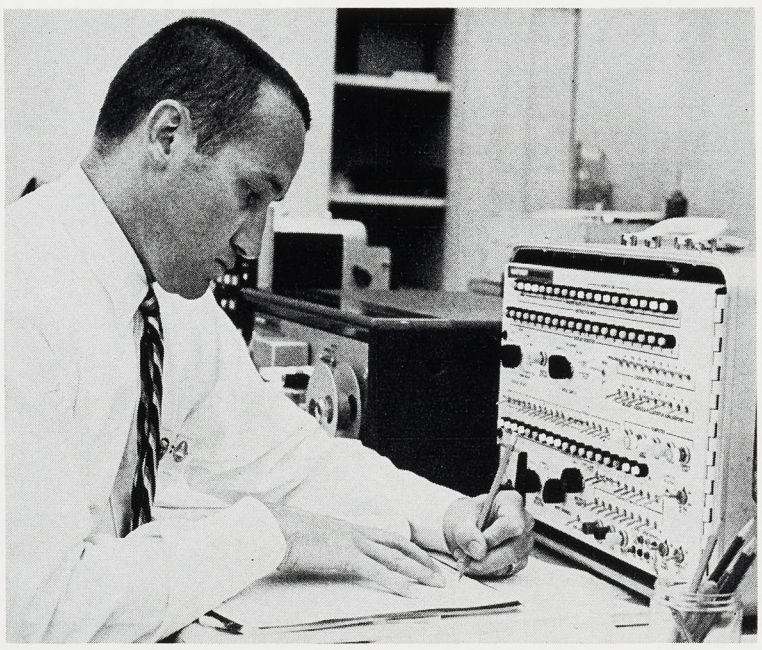
His other assignments in Europe have included boundary layer research, Q4B target drone development, and work on the Ranger program.

He first joined Northrop in 1948.

ONE PLEDGE DOES IT

AID-United Givers has more than 350,000 employed men and women in communities throughout Southern California helping the less fortunate by their simple yearly pledge.

FLIP FOR SHORT



Floating Inertial Platforms (FLIP) were described by Leonard J. Baker, chief of Inertial Systems group, during presentation at AIAA/ION Conference August 16-18 at University of Minnesota. Inertial components are isolated by floating sphere. With small general-purpose digital computer added, device becomes portable "suitcase navigator." It provides all-attitude capability.

CMIP: Another $19 Million Added To Growing Total of Cost Reductions

(Continued from page 1)

CMIP work is conducted by a committee of coordinators headed by Ken Hornor in the Corporate office. Each facility is represented on the committee by its own coordinator.

Cost improvement items may originate as a management-planned economy, as a team development or as an individual employee's idea.

One such idea from an individual provided a saving this year of $311,143. Joseph Radigan, director of Marine Navigation Systems at Nortronics (Palos Verdes) suggested that a standard drawing be developed for the Nortronics Floated Inertial Platform (FLIP), which in the past required adaptation to each new customer's requirements.

The drawings then required only tabulated changes to be useful on any given contract.

Another idea, from L. J. Wisken of Project Liaison Engineering at Norair (Palmdale), effected a $153,000 cost reduction.

Mr. Wisken recommended that the upper engine bay cooling plenum in the T-38 and F-5 be constructed of less expensive materials.

Investigation showed that since the temperature in the affected area did not exceed 300 degrees F., the modification could be carried out utilizing a less complex configuration and combinations of sheet steel, aluminum and fiberglass.

Three government categories have been established to record types of cost reduction items: Reduction of Operating Costs, Buying Only What Is Needed, and Buying at Lowest Sound Price.

During fiscal 1965, reduction of operating costs accounted for an overwhelming proportion of saved dollars, $13,864,525 and 903 items. Within this category, organizational changes investigated since early 1964 were accomplished during the year, eliminating some operations and improving others.

Buying only what is needed saved $2,484,656 based on 164 items, and buying at lowest sound price provided savings of $2,756,039 on 276 items.

PICNIC

(Continued from page 1)

The picnic is sponsored by the Northrop Ventura Recreation Club. Reservations are required at 50 cents for adults, 25 cents for children 6 to 16. Reservations can be made by contacting NVRC officers and commissioners.

RECREATION

Ventura Softballers Capture Second Place

After a slow beginning, Northrop Ventura closed its softball season in second place with a 4 and 4 win-loss record, Chuck Taylor, manager-player, reported.

Playing in the Conejo Valley Recreation League, Ventura received its second place trophy from the Conejo Recreation and Parks District, Thousand Oaks.

Two team members were nominated to the All Star team by a vote of the players on all teams in their division.

One of the All Star nominees was J. R. "Andy" Andrews, pitcher and line supervisor for T-38 seats in Manufacturing, who joined the team after the season had begun. The second All Star was Ron Lancaster, shortstop and a budget analyst in the Technical Cost Control group.

Ventura old-timers, softballers not on the team this season, will play a post-season game with the Venturans at the Thousand Oaks Recreation Center October 10.

* * *

NVRC Golfers Plan Circle R Weekend

Northrop Ventura golfers will take over the Circle R Ranch at Escondido this weekend for the fifth consecutive year.

The golf club and guests will not only tee off at the ranch's 36-hole course both Saturday and Sunday morning, they will lodge and dine at the Circle R, partaking of a prime rib feast Saturday evening in the dining room and on the ranch terrace.

Eight a.m. starting times have been reserved for the club on Saturday and Sunday.

* * *

Venturans Plan Trap Shoot at Chatsworth

The Northrop Ventura Rod and Gun Club will hold a trap shoot 10 a.m. October 9 at the Agua Sierra Gun Club, open to all Northrop employees and guests, including women and children.

The Agua Sierra's range is at the extreme west end of Devonshire in Chatsworth. Guns and ammunition will be available.

* * *

NVRC Clubs Garner Cash for Displays

Three Northrop Ventura Recreation Club activity groups have received cash awards for their displays on the club bulletin board in the cafeteria, John Lawrence, NVRC president, announced.

The Golf Club received $25, Travel Club $15, and the Rod and Gun Club $10 in the first quarterly contest for displays showing club activities.

Chuck Halliday and Jack Sheridan will represent NVRC as judges for the current quarter's displays.

CONTROLLER

(Continued from page 1)

—A mortar deploys two drogue chutes.

—Drogue chutes are released as mortar deploys three pilot chutes (which pull out the main cluster of three 83-foot Ringsails).

—Main chutes disconnect from spacecraft at earth impact.

"A problem in early development of encapsulation techniques was the fact components could not be replaced if they became defective," Mr. Estes said. The material could be broken up, but not without destroying the circuitry.

"Now we have developed a technique for replacing components in the controller, representing a savings of thousands of dollars to the Apollo program."

The section has improved reliability of electronic packages in other ways as well. Modules are now being welded instead of soldered, giving a strength that is twice the NASA minimum standard.

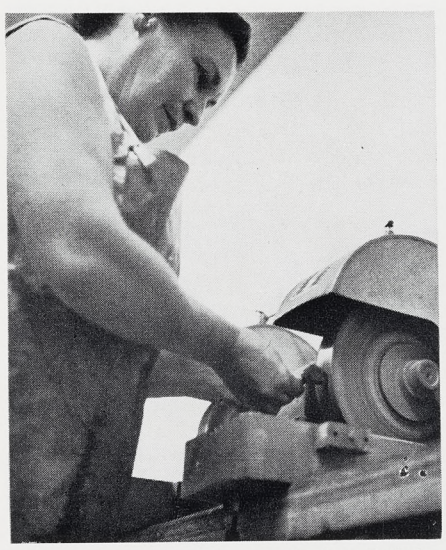
Thermo Bonding section has responsibility for other programs, including production of ejection bags for Convairs' B-58 bomber. Made of rubberized nylon, the bags are part of the pilot escape system. Mr. Estes reports that the 200th consecutive defect-free bag has recently been delivered.

Despite the fact the section is involved in quantity production, it is still described as "model-shop operation" by Mr. Estes, because of the advanced techniques used.

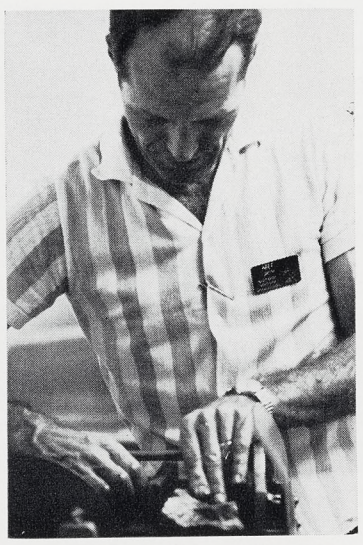
The section's work will probably continue to become more varied, but the prime exhibit for a long time will undoubtedly be the Apollo sequence controller. It's reliability goal permits the probability of only one failure in 10 million landings of Apollo spacecraft.

Before starting your summer vacation trip, the Greater Los Angeles Chapter of the National Safety Council urges you to "safety check" your car.

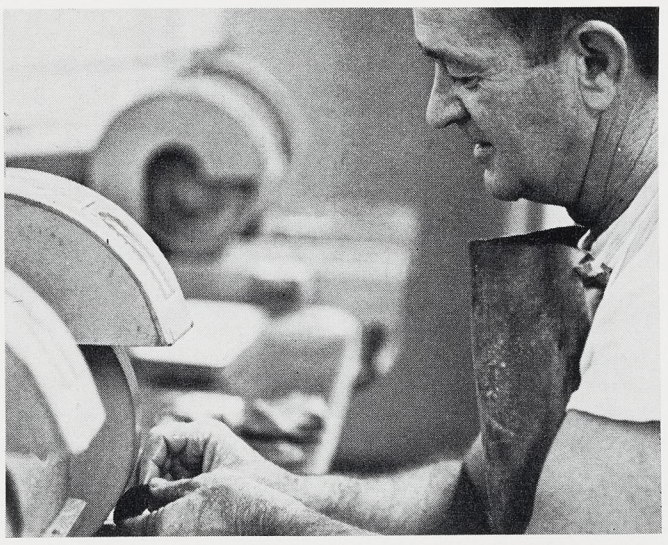
NVRC GROUP HAS ROCKS ON ITS MIND, FROM DESERTS TO PRIVATE LAPIDARY



With artisan skill and concentration, Eathel Bondi, a member of the Northrop Ventura Rock Hounds, grinds a cabochon to shape, first step in preparing stone for mounting.



Art Smith, an officer of the Rock Hounds, cuts off a specimen of jade which eventually will be mounted.



Hank Widmer, another NVRC officer, has already finished with grinder and is now smoothing and polishing his stone. Lapidary equipment for club is at 18148 Sherman Way, Reseda, where group conducts business meeting the second Friday of each month.

Still another wheel in the intricate process of grinding and polishing is used by Fred Howard, who is putting the finishing touches on his specimen.

A Candid Camera at NVRC Annual Picnic...Page 4

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California Vol. 23, No. 17 October 6, 1965

Northrop's Net Income Increases

Northrop's consolidated net income for fiscal 1965 was $8,683,000, an increase of 28 percent over last year, it was announced by Thomas V. Jones, president and chairman. Earnings for the fiscal year, which ended July 25, are equivalent to $2.10 per share on 4,126,446 shares outstanding at the year end, as compared with $1.66 on 4,085,439 for the previous year.

Net sales for the twelve months totaled $339,324,000, an increase of 12½ percent over the previous year's sales of $301,811,000.

While the F-5 tactical fighter and the T-38 supersonic trainer comprise the largest single product category in the past year's sales, more than half of the company's volume represented sales primarily of guidance and tracking systems, communications systems, recovery systems for manned orbital space vehicles, and such precision equipment as inertial guidance gyros and marine equipment in the communication and detection field, according to Mr. Jones.

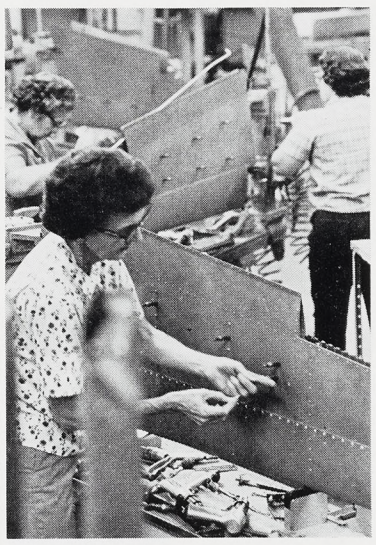
In the fourth quarter of the year ended July 25, 1965, consolidated net income totaled $2,547,000, equivalent to 62 cents per share, as compared with $2,089,000, equivalent to 51 cents per share a year earlier. Net sales

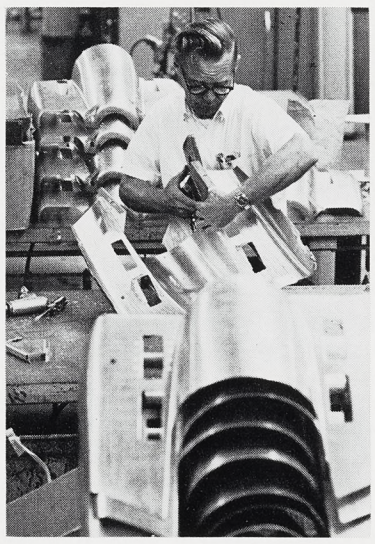
(See EARNINGS, page 6)

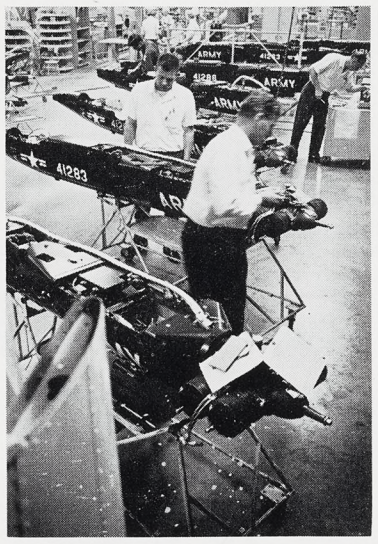
New Fringe Benefit Feature Makes Debut

A new NORTHROP NEWS feature covering a topic of general interest to all employees—fringe benefits—makes its debut on page 3 of this edition.

William Larrabee, Corporate vice president—Industrial Relations, has written the first article. The new feature will be continued in forthcoming editions.







ON THE LINE—Northrop Ventura surveillance drone (MQM-57B) is presently in final assembly stage under U.S. Army contract. Working on the wing line (left) are Maxine Buchanan, Juanita McGrath and Mary McDaniels, while Aldean Holman (center) is assembling lower cowl. On-line inspection (right) is conducted by Bill Cope and Russell Messick, while Merland Thiesen and Clarence Ayres (background) continue to work on final assembly.

SHUTTER BUG DRONE

Improving Combat Surveillance

The former commander of one of six Ranger battalions which spearheaded every major invasion during World War II reached for a model of a Northrop Ventura surveillance drone (MQM-57B) as he said:

"We learned the hard way that eyeball contact isn't good enough as the first indication of an enemy's location or movement."

Col. Murray

Colonel Roy Murray (USA-ret.) has been campaigning for better surveillance techniques which are directly responsive to the field (division) commander since World War II.

"One good example was the stand of Third Army units in the Ardennes Forest during World War II. Under cover of a heavy fog, more than a dozen German Panzer divisions broke through U.S. lines and almost pushed the American forces out of Belgium. The weather kept our planes grounded for days. The only time we knew of German movements was when with actual contact, and many times that was too late for successful reaction."

In Korea, he continued, the Communists built railroads at night, camouflaging as they went, and escaped detection.

Such experiences as these prompted the Army in 1957 to contract with Northrop Ventura for development of the first operational battlefield surveillance drone. Designated the USD-1 (Unmanned Surveillance Drone), the vehicle became operational in 1959.

The concept had been proven feasible with an earlier Northrop drone, the OQ-19, which had been modified to include a camera bay.

But the SD-1 became a system which has been deployed by the U.S. Army in Europe and the Far East. Two years ago, the drone portion of the system was designated the MQM-57A. Last year the radio flight control subsystem was made more secure from spurious signals, and the drone was redesignated MQM-57B.

Colonel Murray's interest in surveillance by drone was heightened when he was named commandant in 1962 of the U.S. Army Combat Surveillance School at Fort Huachuca, Arizona. There he came in contact with Northrop vehicles and also Divisional technical representatives who were instructors in the school.

(See DRONES, page 6)

Northrop Satellite Slated For Launch This Month

Solar panels of OV2-3 satellite are readied at NSL.

A space environment sensing satellite designed and built by Northrop Space Laboratories will be placed in orbit as a "bonus" payload on the development launch of the second USAF Titan III-C from Cape Kennedy this month.

Developed for the Air Force's Office of Aerospace Research, the satellite is designated OV2-1, for Orbiting Vehicle Two, first article. (Northrop is building a second OV2 to be launched similarly as a bonus payload on a later Titan III-C development flight.)

The OV2-1 carries sensing instrumentation for 14 experiments on various factors in the space

(See SATELLITE, page 6)

TECH REPS JARRED BY TRANSLATION OF JAM-PROOF DRONE

Northrop Ventura technical representatives, who have been training military personnel around the world since 1942 of Northrop drones, were put to an unusual test of instructional skill this month in Italy.

Jerry Koopman and Wayne Beck, who have been instructing Italian Army personnel since July in implementing the Northrop-produced MQM-57B surveillance drone, were explaining that the radio-controlled vehicle could not be jammed thanks to a secured flight control system.

After an unusual amount of conversation among the students, it was determined that the words "jam" or "jamming" of equipment, through an Italian interpreter, comes out "Marmalade" every time, leaving the students not only confused but bewildered.

But the tech reps are real veterans at fielding such unexpected questions, and the setback was only temporary. They have helped the U.S. Army implement the same vehicle in the U.S. and abroad and served as instructors at the Army Combat Surveillance School at Fort Huachuca, Arizona.

M-C Nominations To Be Presented

Nomination of officers for the coming year and an analysis of the Latin American situation by a veteran political observer will highlight the October 20 meeting of the Northrop Ventura Management Club.

A nominating committee, headed by Ralph Friesen, will propose a slate of officers, and further nominations will be taken from the floor, according to Club President William F. Green.

Guest speaker will be Gilbert Richardson, Russian and Latin American specialist, who has completed a recent trip to Santo Domingo.

Mr. Richardson is a member of the political science faculty at Pepperdine College and has served as a member of the nation's committee on Pan American Policy.

The dinner meeting will be at Los Robles Country Club. Tickets are $3 each.

CAROLINA COMPANY ACQUIRED

Northrop has reached agreement in principle with Celanese Corporation of America on the acquisition of Amcel Propulsion Company, a division of Celanese. Amcel Propulsion develops and manufactures chemicals, explosives, ordnance and rocket propulsion devices for the Department of Defense and NASA at its plant near Asheville, North Carolina.

In addition, to its weapons and rocket work, Amcel does engineering and systems design and produces control devices for the capital equipment market outside the defense industry.

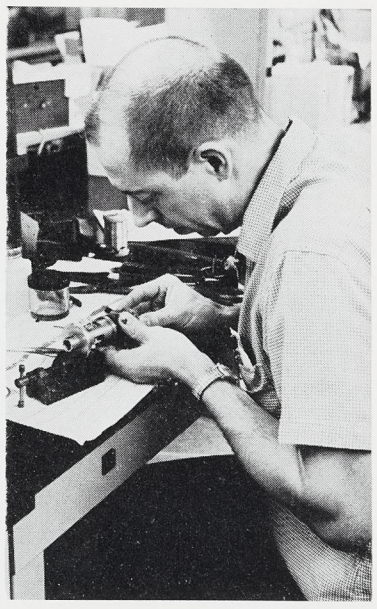
Northrop announced that it planned to acquire the assets of Amcel Propulsion for cash, although no price was disclosed. Amcel Propulsion will be renamed Northrop Carolina, Inc., and will be operated as a wholly-owned subsidiary of Northrop Corporation.

Thomas V. Jones, Northrop president and chairman, said, "Amcel Propulsion's products have growth potential which can be developed and accelerated through Northrop's extensive experience in aerospace weapons and systems. Also, Northrop's capability in the development of electromechanical control devices for the aerospace industry should prove most useful to Amcel's expanding commercial business. Thus, it is a logical acquisition that insures continuing growth for the present Amcel organization.

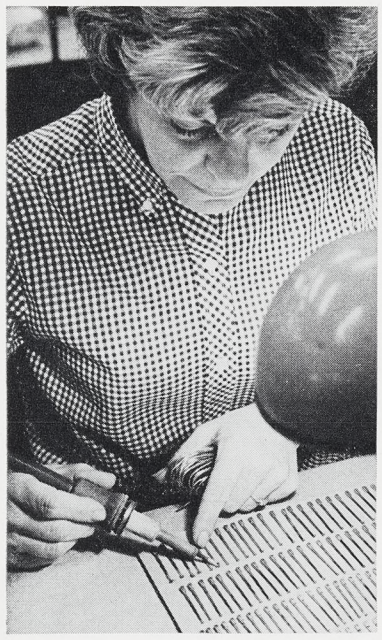
"Amcel's current management and operating personnel have our complete confidence," Mr. Jones

(See AMCEL, page 6)

VALLEY COUSINS



George Potts of Northrop Ventura's Aero Instrument facility in North Hollywood holds pressure transducer now under development. Aero Instrument is featured on page 2 of this edition.



Aero products are diversified. In photo sequence from left, Josephine Oriface solders reeds to fit frequency meters, Scotty Carruthers checks decoder subassembly, Maureen Lawrence and Frances Seale assemble two of a variety of circuit boards, and Dan Snively inspects aft nose section destined to become part of a Maxson drone.

Switches, Sensors Pace Growth of Aero Facility

Like many other organizational components of aerospace companies, Northrop Ventura's Aero Instrument Facility in North Hollywood was once an independent corporation.

Aero Instrument first opened its doors as a school rather than as a manufacturing concern in 1943 and became a product-line oriented company three years later.

The company had proprietary rights to a patented cup-shaped diaphragm which, utilized in a variety of pressure switches, provided an unusual degree of reliability.

It also had an organization, and technological and production capabilities that could be useful in support of a corporation desiring the strength of diversification.

So, to the mutual benefit of Northrop and Thomas O. Cox, the head of the firm, in 1960 Aero became a facility of Northrop Ventura. Mr. Cox remained as director.

In the fall of 1964, Mr. Cox retired and Richard M. Warner, a member of the Northrop staff since 1940, took over the directorship.

Mr. Warner had held managerial positions in manufacturing, quality control and engineering, a background suited to the direction of an autonomous facility.

With the addition of Bill Chew, a new chief engineer, and Ed McGinnis, chief of quality control, plus realignment of the production operation functions under Scotty Carruthers and Paul Studt, Aero is continuing a growth and expansion cycle. By the end of the year Aero will have established totally new production capabilities for a recently designed pressure transducer, in addition to expanding facilities and capabilities in the standard product lines.

Mr. Warner
Director

Mr. Illes
Marketing

The facility is still product oriented, operating almost like a company within the Ventura Division. About half of its business is with the government and half with commercial firms.

Aero had been producing reed frequency meters and running time meters since 1946. In 1952, John Lovick, instrument research engineer, conceived and designed the patented pressure switch.

The patents are based on a cup-shaped diaphragm which to date has permitted a record 300,000 cycles without failure on tested units, far exceeding the usual aeronautical requirement of some 10,000 cycles.

The switch, designed for the Lockheed P2V, is still being used in the patrol aircraft. The design has been adapted for use on the Boeing Vertol Chinook CH-47A helicopter and other Boeing helicopters. In these craft it is used typically within engine warning systems, indicating fuel or oil pressure, or hydraulic system pressure.

Mr. Lorentson
Office Manager

Mr. Chew
Chief Engineer

It will also find a place as a depth switch in one of the U.S. Navy's advanced torpedo designs, the Mark 48. Allis Chalmers includes the Aero switch in fuel cells for the space program, and a North American jet trainer utilizes Aero pressure switches.

The basic design is adaptable to a variety of environmental extremes.

Aero products have since been expanded to include the pressure transducer, frequency converters for meters, and pointer indicating frequency meters.

The facility also manufactures electronic decoders, servo motors, junction boxes and electronic harnesses and printed circuit assemblies for Ventura and other customers.

The electronic decoders are the heart of the flight control system and will find their way into the radio control system of targets and drones. The servo motors, built at Aero to fit the needs of the division, provide a highly reliable control surface actuator for the Ventura targets and drones.

The pressure transducer is becoming a leading item, and a contract for production of a substantial number of units a year is in effect with Maxson Electronics of Long Island, New York. The transducer fits into a Mach 3 drone, the AQM-37A, driven by a Rocketdyne liquid-fueled rocket.

Other firms are investigating its use for adaptation to their products.

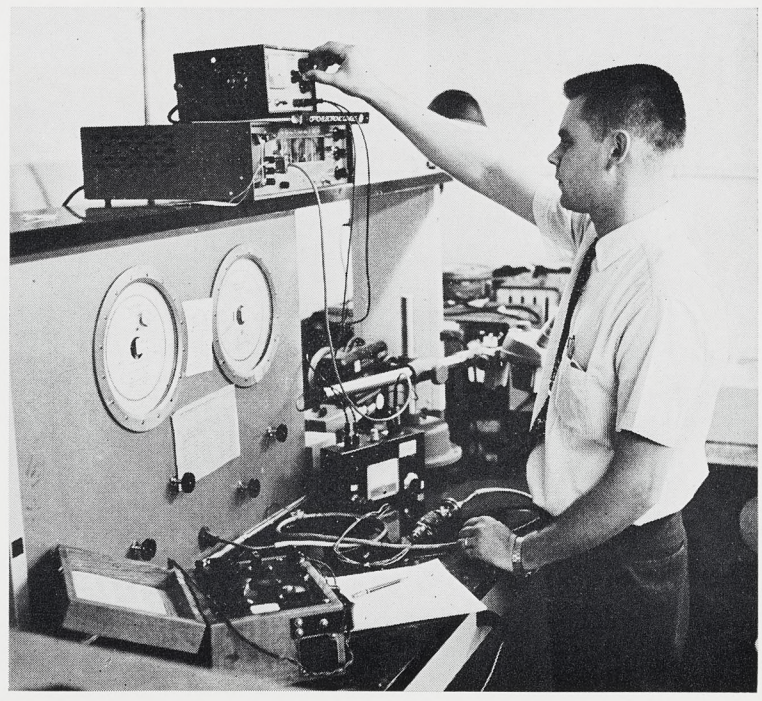
Utilizing photoconducting cells

(See INSTRUMENTS, page 5)

PRODUCT REVIEW

Pressure switches like one being inspected in left photo by Martha Lyth and Darrald Wolfe must meet rigid specifications. This switch measures fuel system pressure in North American T-39 jet. Above, Gladys Young assembles servo motors for drones built by Ventura. Newest product at Aero, right photo, is pressure transducer being tested and calibrated by Dick Hauer, who designed the unit.

Photos by
Bill Cox, Bob Steingart



Open House At Palmdale October 17

Northrop Norair will roll out the welcome mat for all Northrop Corporation families October 17 at its Palmdale Production Flight Test facility.

The occasion will be a special open house just for Northrop people held in conjunction with an Antelope Valley Aviation Day observance open to the public.

Richard E. Horner, Northrop senior vice president and Norair general manager, announced the special Northrop open house was arranged in response to numerous requests by employees for an opportunity to see completed F-5 tactical fighters and T-38 trainers in static display and in flight.

"Our open house will afford Northrop families a close look at our final assembly and flight test operations," Mr. Horner said. "Later, at the Aviation Day observance, they will see both the F-5 and T-38 in flight along with other aircraft as well as an outstanding program."

Because the open house is exclusive for Northrop families, special gate passes will be required for admittance. They may be obtained from all Personnel Activities offices throughout Northrop.

Gates at the Palmdale Production Flight Test facility will open at 9 a.m. and close at 11:30 a.m. with the area to be cleared of visitors by noon.

Northrop families will be able to move through the major areas of the facility to view each step followed by fighters and trainers from arrival to preparation for delivery.

Following the Northrop open house, families will have ample time to move to special parking areas reserved for the Aviation Day event. Families are also invited to bring along basket lunches, since food services will be available only in the form of limited catering facilities.

At 1 p.m. the Aviation Day gets under way with special static displays of all aircraft currently being processed at Air Force Plant 42, including both the F-5 and T-38. Special fly-by events will follow.

Climaxing the afternoon's entertainment will be a special precision flight demonstration by the famed U.S. Air Force Thunderbirds.

FOR SERVICES RENDERED—Northrop Norair's Charles W. Eyres (right) recently received special certificate for services rendered American Institute of Aeronautics and Astronautics by National President Richard E. Horner. Mr. Horner is Northrop senior vice president and general manager of Norair. Norair models in foreground are symbolic of division's work in both aeronautical and astronautical fields.

AF OFFICERS BEGIN TEN-MONTH TRAINING PERIOD AT NORTHROP

Air Force Captains John W. Cannon and Gene C. Sue have reported to Northrop Corporation to begin a 10-month Education With Industry program in Industrial Planning and Procurement.

The two officers, assigned by the Air Force Institute of Technology, will pursue their studies at Northrop's Corporate office and at Norair, Nortronics and Ventura Divisions. They will receive on-the-job training in Northrop management procedures, approaches, philosophies, tools and techniques.

Captain Cannon entered the Air Force in 1957 after obtaining a B.S. degree in industrial arts from Memphis State University. Captain Cannon has served the Air Force as an aircraft commander, instructor pilot and flight examiner. His most recent duty assignment was with the Office of Aircrew Standardization, 38th ATS (MATS) at McGuire AFB, New Jersey.

Captain Sue holds a B.S. degree in business administration from Ohio State University and has been in the Air Force since 1954, serving as a senior navigator, operations officer and standardization officer. He comes to Northrop from a duty assignment with the 437th Fighter Interceptor Squadron (ADC) at Oxnard AFB, California.

Harry Blocher, supervisor of Training Equipment branch, Field Service and Training group, Product Support department at Northrop Norair, will coordinate the training program of the two officers at Northrop.

Disneyland Tickets Are Still Available

Tickets are still available to Northrop personnel for the Association of the United States Army's Disneyland night, Friday, October 22.

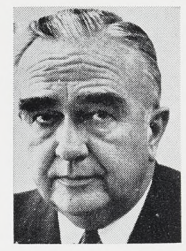
The Greater Los Angeles Chapter of AUSA extended its invitation to people from Northrop at the special association rate of $3.75 per person for admission and unlimited use of Disneyland attractions. The tickets may be obtained from Personnel offices.

TOUR CANCELLED

The NRC Travel Clubs' tour of Mexico scheduled for the yearend holiday will not take place as planned. Arrangements were being handled through the Nortronics Anaheim Personnel Activities office.

FRINGE BENEFITS

A Balanced Program



by WILLIAM LARRABEE
Vice President—Industrial Relations

Not too long ago I was discussing Northrop's fringe benefit program with one of our young men, when he suddenly said:

"It seems to me that you Industrial Relations people are missing a bet by not having our paycheck stubs include a list of every fringe benefit with a big black FREE printed alongside it."

Well, there just isn't room on a paycheck stub to list all our fringe benefits but the basic idea—that fringe benefits are an important and often overlooked aspect of working with Northrop and that our people want to know about them—stuck with us.

This was confirmed in a recent survey taken by an outside agency on what employees thought of the Northrop News. In that poll, an overwhelming majority of the people said that they wanted to hear more about the Northrop Fringe Benefit Program.

Therefore, in the forthcoming issues of the Northrop News I will discuss our benefits and illustrate how they affect each of us.

It might be helpful, initially, to point out again the general policy of Northrop with respect to all types of compensation, including fringes. From the very beginning of the company it has been clearly stated that Northrop people are to receive wages and benefits comparable to those prevailing in our industry. Today, this policy is reaffirmed and continuously reviewed by our president, Thomas V. Jones.

Consequently, studies are continually made of compensation patterns on national, state and local levels. This work is done under the direction of your Interdivisional Industrial Relations committee which is made up of the directors of Industrial Relations of each Division and the Corporate director of Industrial Relations.

Last May, important benefits were extended to Northrop people in the way of wage increases, group insurance improvements, vacation entitlements, bereavement pay, extended layoff benefits, etc. Still under consideration are possible improvements to our savings and retirement plans, further benefits in the field of group insurance and other matters.

On some of these having to do with retirement we have to go to our stockholders for approval and most changes require the concurrence of appropriate government agencies. At the next stockholders' meeting in December we will ask for approval of several retirement plan changes involving better minimum guaranteed pensions, better early retirement provisions and an amendment providing that the new Social Security base will not reduce our retirement pay. It is anticipated that announcements will be made in the not too distant future and certainly before the end of the year on these and other subjects.

The Northrop program is a balanced program which is best suited to our needs as employees of our company. Certainly, there are many areas where we have pioneered in fringe benefits in our industry. For example, I know of no one who does not envy us our week-long Christmas holiday. On the other hand, if we look hard enough we can always find some single thing in some other company which we might like to have. The value of a good fringe benefit package does not lie in adopting some benefit at some other company which looks good but may prevent us from getting something which we need more.

The best track athlete is the decathlon champion, like Bob Mathias or Rafer Johnson, who is excellent in 10 events but who may not hold the world's record in any one. Our Northrop fringe package holds a record once in a while in some event (like our Christmas holiday), but it is primarily designed to cover our broad needs as Northrop people and yet put us on a comparable basis with the over-all fringe benefits of our competitors. Our Company has done a remarkable job over the years in providing us with this kind of coverage.

NOW, ABOUT THAT MISSILE . . .

Jim Hock Likes Placentia and People Who Ask Questions

The lumbering tracked vehicle shuddered to a stop. The driver removed his crash helmet and goggles. The police officer stepped out of his patrol car and took the traditional stance.

The conversation went something like this:

"Was I speeding officer?" "No sir." "Run a stop sign?" "No sir." "Fail to signal a turn?" "No sir." "Then what . . . ?"

Mr. Hock

"Well, sir, I realize you are the mayor which gives you certain rights," the officer stammered, "but does it entitle you to have possession of a U.S. Army missile vehicle? I'd like to check this out, if you don't mind."

A few quick radio calls verified the driver, and mayor of Placentia, California, was en route to a remote Santa Ana river bed area to test the Hawk missile loader in his capacity as a Northrop Nortronics (Anaheim) Ordnance Laboratory test engineer.

James W. Hock, Northrop 18-year veteran, was the driver-mayor-test engineer. And the police officer's interest pleased him.

Jim Hock has a reputation as a question asker. In fact, fellow citizens and city officials dub him as the "Number one question asker in all of Placentia."

"Sure I ask questions, lots of them," Jim Hock admits. "It is a wonderful way to learn and I've never met a man who could not teach me something. Questions make this possible."

Jim Hock is a remarkable contrast to the stereotyped "politician." He'd never dabbled in politics when he moved his family to Orange County in 1953 and resettled three years later in Placentia.

First, the interest of fellow Nortronics employees living in the community prompted him to accept a two-year appointment to the Placentia Planning Commission. His wife, Peggy, accepted a similar post on the Parks and Recreation Commission.

In 1960 Jim Hock was a successful candidate for a four-year City Council post. This group named him mayor for one year (filling out a term), then returned him to a full two-year term. Last year he was elected to serve another four-year City Council term (running to 1968).

Placentia was a sleepy little community of about 3000 when the Hock family moved there. It now has 16,000 residents in a five-square-mile area bordering Anaheim, Fullerton and Yorba Linda.

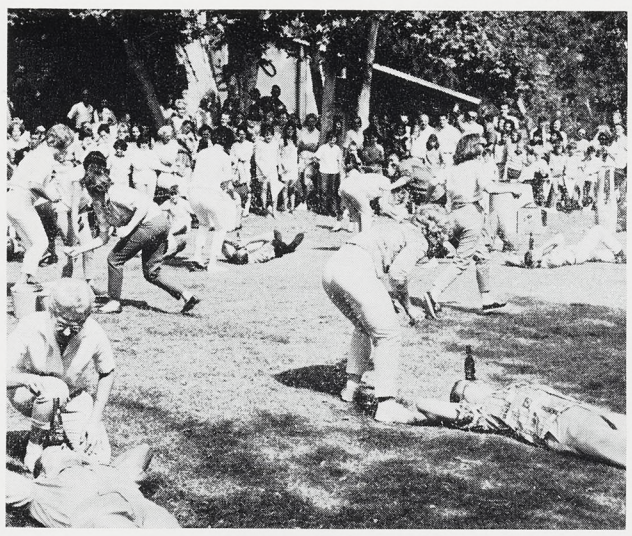
Jim Hock is justly proud of the city's progress in this short span of years. It has built parks and set aside land for others; turned its firefighting unit from volunteers to a full-time staff of 16 with two stations; and increased its police force from five members to 20. Naturally, there have been other advancements, industries brought in, etc.

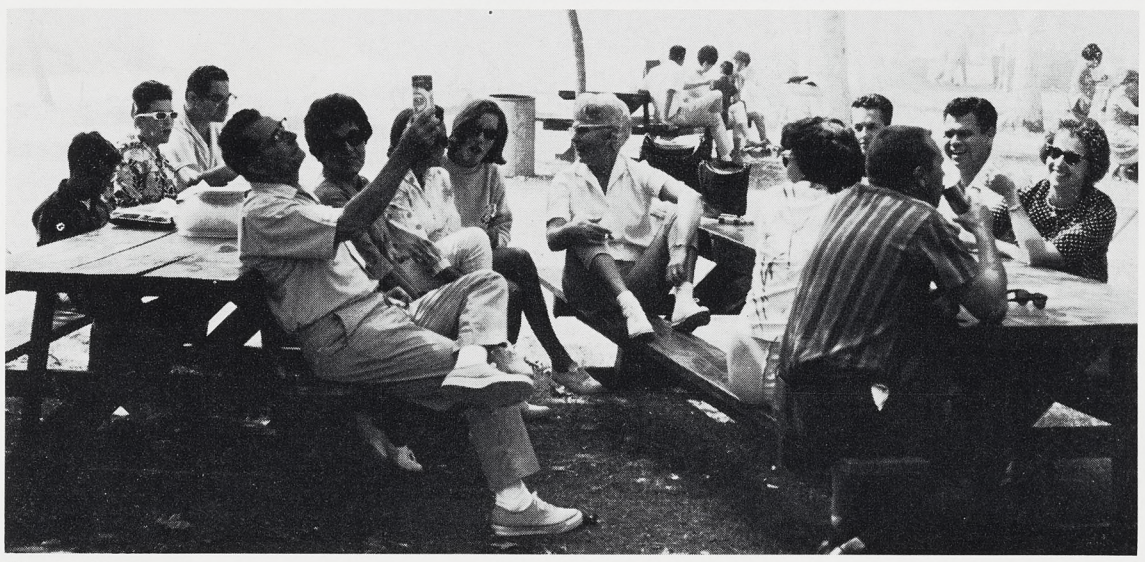
However, the community remains primarily a residential area predominantly higher in income and education than the average area of comparable size.

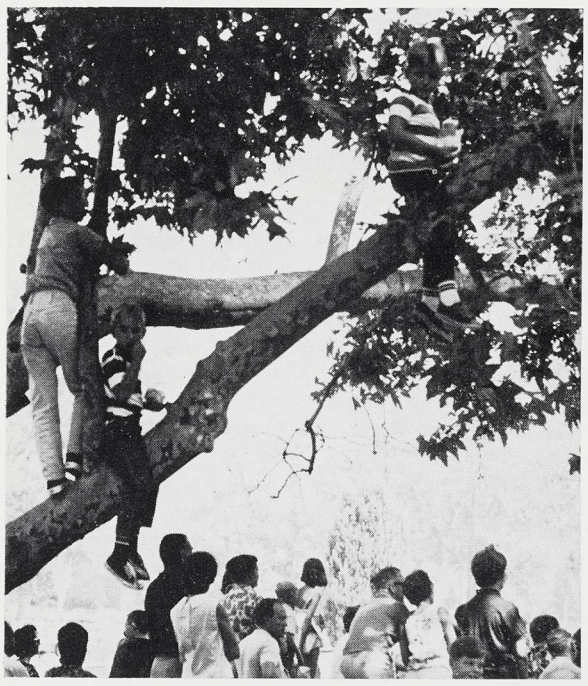
"Our citizens know what they want, and do not want, in a community," Jim says. "And they are active, very active, keeping elected officials on their toes at all times."

Placentia is conscious of its heritage, dating back to Spanish land grants of the mid-1700 era.

(See PLACENTIA, page 5)

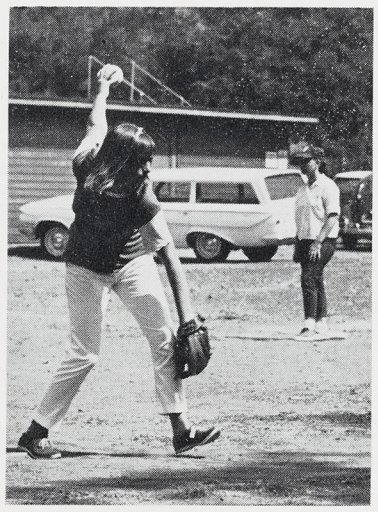


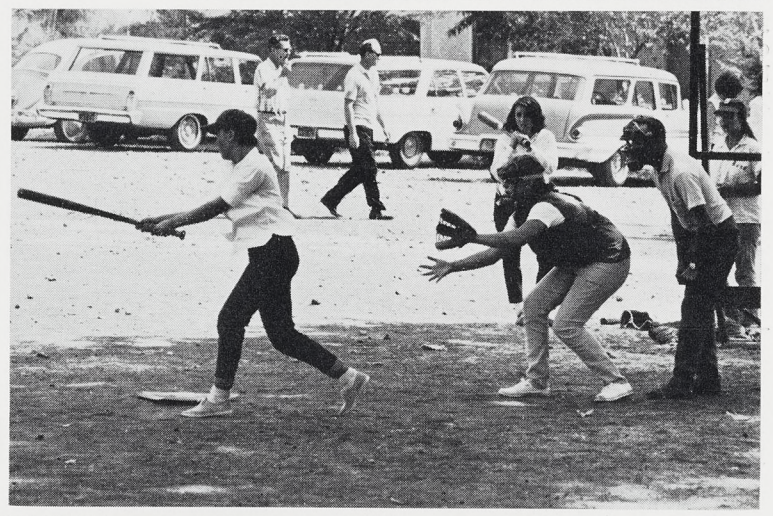


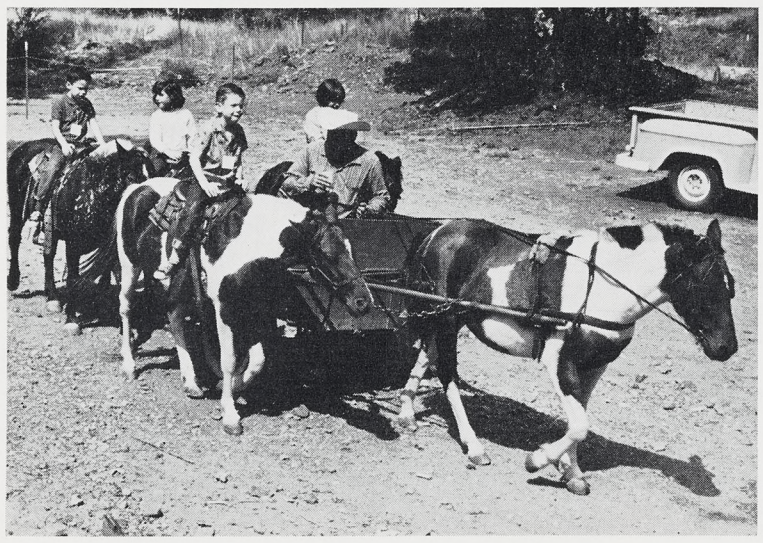


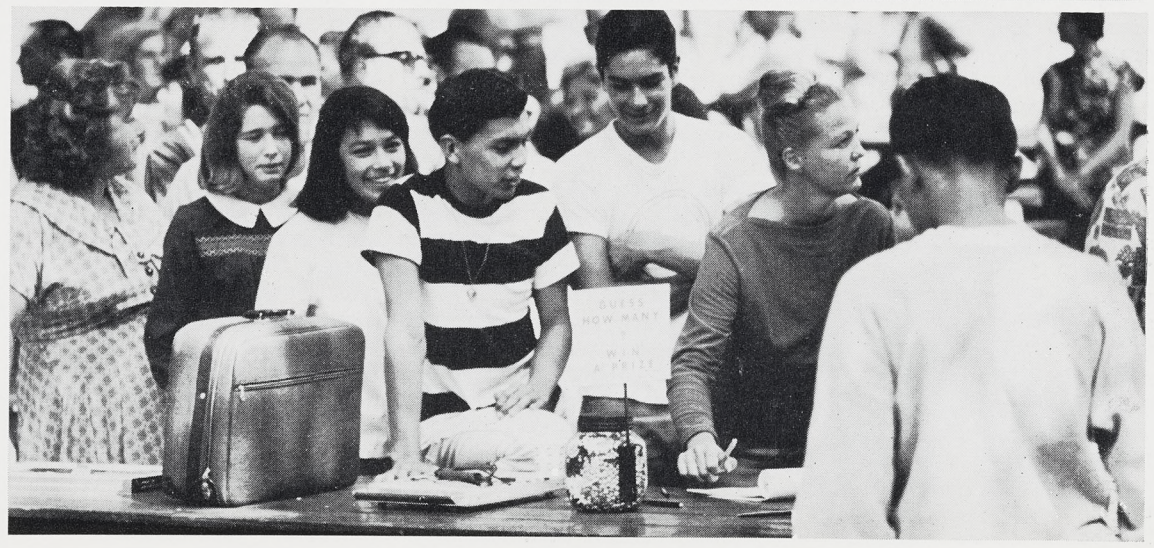
HIGHLIGHTS OF ANNUAL PICNIC SPONSORED BY NORTHROP VENTURA RECREATION CLUB SEPTEMBER 27

Photos by Danny Cashier









Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

VW, Sunroof, 1963, $1250. Long Bch., 596-1280. A

Piano, Spinet, Shoniger, oak, $475. L.A., 645-2665. A

MGA, 1958, custom paint, top, & tonneau cover, r/h, $975. Playa del Rey, 398-1458.

House, 1,500 sq. ft., 3-bdrm., 1¾ bath, 2-level, playroom, dishwasher. elec. or gas kitchen, $34,950. Playa del Rey, EX 1-4860.

Honda 50cc, 1963, $125. Lakewood, 867-3367. A

Pups, boxer, AKC, fawns & brindles, $75 & up. Redondo Bch., FR 8-4676. A

Monza, 1965, low mileage, 4-spd., stick shift, $100 for equity & take over $84 mo. payments, $2200 bal. El Segundo, EA 2-3254. A

Figure Ice Skates, w/guards, boy's size 6, used once, $10. Torrance, FR 8-1350. A

Boat, Ford V-8 85 hp motor, lge. wheel trailer, rope, ski, $600. Hawthorne, OS 6-4503. A

Chevrolet, Impala, 1965 SS, all extras, factory air, $3100. Gardena, DA 9-6848. A

Shopsmith, complete incl. jointer, $180. L.A., PL 7-7911. A

Ford, 1956 sedan, near new tires, brakes & battery, recently o/hauled, p/s, $325. Buena Pk., TA 8-2857. A

Drafting Machine, Bruning model 2699, 24" x24" arms w/18" plastic blade, $50. Inglewood, OR 7-9303. A

Chevrolet, 1961 2-dr. sedan, stick shift, 6-cyl., 55,000 miles, $550. Inglewood, OR 4-6386. A

Corvette Stingray, 1963, hard & soft tops, r/h, 4-spd., 4:11 posi., Hayes clutch, Jardine headers, $3400. La Habra, 691-9534. A

Morgan SS, 1960, TR eng., Nardi steering wheel, r/h, $1495. Santa Ana, LI 4-6135. A

Piper PA 16 Clipper, tan & white, less than 1000 hrs. A & E, omni., $2000. Whittier, 213-944-3776. A

Plymouth, 1956 station wagon suburban, r/h, new tires, $100. Inglewood, 672-2315. A

Mobile Home, 1962 Crusader, 60'x12', factory air cond., 30x8 porch, alum. awning, car port, $8900. Torrance, DA 5-3649. A

Chevrolet, 1954, 2-dr. sedan, r/h, new tires, orig. owner, $250. Redondo Bch., FR 6-6415.

Harley 74 FLH, 1965, 1700 miles, $1650. Gardena, 679-3927. A

Dining Room Set, Duncan-Phyfe mahogany, lge. silver chest & high-boy, $75. L.A., AX 2-6909. A

Karmann Ghia, 1960, new eng. & access., 1964, new paint, good tires, $950. Van Nuys, 786-4742. A

Chevrolet Impala, 1964, SP convt., r/h, record player, 327 eng., 4-spd. trans., $2400. La Habra, 691-0106. A

House, 2-bdrm., 1 bath, patio w/built-in bar-b-que, near grade school, int. recently painted, $16,000. Torrance FR 1-0629. A

Golf Clubs, Sam Snead champ. quality, irons 2-9 & wedge, woods 1-4, head covers, bag & cart, $150. Hawthorne, OS 5-3711. A

Guitar, elec. Melody, w/med. size magnatone amplifier, $150. Rolling Hills, 833-9747. A

Apt. Units, 5 deluxe, 2200 sq. ft., owner's unit sep. f.a. heat, 3 bdrms. & family rm., $67,500. Hawthorne, OS 5-3792. A

Porsche, 1954, $1100. Manhattan Bch., 374-3365. A

Refrigerator, 1956 Westinghouse, cross top freezer, $65. Portuguese Bend, FR 7-5370.

Outboard Motor, Johnson 30 hp, new power head, $125. Hawthorne, 676-1441. A

Stereo Hi-Fi Components, AM/FM tuner, dual amplifiers, dual preamps, 4 speakers, stereo turntable, complete, $66. Hawthorne, 676-0418. A

Dining Room Set, oak, table extends to 90" 5 chairs, 1 arm chair, buffet, $50. Box 1701.

Air Conditioner, RCA Whirlpool, 7000 btu, auto. temp. control, 3-spd. fan, outside/inside air control, $100. Miraleste, 547-2870. A

Air Cooler, 26x18x17, water circulating-type, 3-spd., used once, $45. Rolling Hills Ests., FR 5-8778. A

Ski Boat, 18', trailer, Chrysler eng., Gibson hull, many extras, $3000. Norwalk, UN 5-8863. A

Refrigerator, crosstop freezer, $20. Gardena, 757-2383. A

Scooter, Cushman, buddy seat & windshield, $120. L.A., 645-2523. A

Surfboard, Bing, $30. Hawthorne, 671-2069.

Sofa Set, 8', brown & aqua w/club chair & ottoman, $125. Hollywood, 876-8712. A

Sprite, 1959, w/tonneau cover, $600. Inglewood, 673-3369. A

For Sale

Bed, hospital-type, mattress, side rails & elevates head, feet & legs, $45. Long Bch., 422-4740. A

Impala sport coupe, 1961, r/h, auto., p/s, p/b, other extras, orig. owner, $1375. Long Bch., 423-7635. A

TV, 17" Hallicrafter, w/gold stand & magazine shelf, $40. Redondo Bch., 374-6684. A

Piano, Lighle & Co., upright, dark oak, $195. Torrance, FR 5-8804. A

Rambler American, 1960, 2-dr., r/h, near new tires, 1-owner, $525. Hawthorne, 644-1572. A

Dinette Set, chrome, w/extra leaf & 4 matching chairs, $15. Hawthorne, OS 5-2514. A

House, 1 mile to Research Pk., 4-bdrm., family rm., 2 baths, built-ins, patio, fenced yd., near schools, $41,900. P.V. Pen., 377-5172. A

Piano, upright, recently refinished, $125. Compton, NE 8-0116. A

TV, RCA 21", color UHF, wood cabinet, $375. Hawthorne, 675-9476. A

Motorcycle, Yamaha, 1964, 125cc, elec. start, $350. Torrance, DA 6-7528. A

Bunk Beds, dbl., wagon wheel, $10. Torrance, FR 5-4574. A

Range, Kenmore, 4-burner, gas, 2-yrs.-old, stainless top & glass, $75. Huntington Bch., 714-842-1781. A

Austin Healey Sprite, 1959, head rests, AM radio, $850. Hawthorne, 675-9540. A

Camera, Argus C-3, 35 mm, flash & case, sun shade & filters, $25. Harbor City, 326-1856. A

Chevrolet Impala, 1964 2-dr. h/top, p/s, p/b, r/h, w/s/w, low mileage, $2295. Hawthorne, OS 9-2122. A

Divan Set, tangerine Naugahyde, $70. Torrance, 320-2002. A

Plymouth, 1964, 2-dr., p/s, p/b, auto. trans., 383 cu. in. eng., $2300. Redondo Bch., 374-2915. A

Cocktail Table, $10. Granada Hills, 324-1494.

Horse, Morgan mare, black, 8-yrs.-old, $300. Torrance, DA 9-2016. A

Muffler, stock, off 1964 VW w/chrome tips, $7. Torrance, 371-8939. A

Organ, 30-chord Silvertone, $90. Inglewood, OS 5-4905. A

Ford Country sedan station wagon, 1957, $400. P.V. Ests., FR 5-5097. A

Pontiac, convt., 1964 Catalina, auto. trans., r/h, power, many extras, $2295. Santa Monica, 393-7464. A

Swimming Pool Filter, Romar, w/skimmer & instructions, 2 cartridges, filters 1100 gals. hr., $20. Torrance, 323-4257. A

Stove, O'Keefe & Merritt contemp. model, clock, timer, meat thermometer, $250. Lawndale, 676-3050. A

Coffee Table, mahogany, $10. Torrance, FA 8-4243. A

Bicycle, 10-spd. Derailleur, $35. Torrance, FA 8-6567. A

Sailboat, 14' Satellite Omega class, spare center board & boom, beaching rudder, dacron sails, trailer, $400. Redondo Bch., FR 5-8938. A

Edger, push-type, red, $2.98. Gardena, 329-9484. A

Camera, Polaroid J-66, w/case, $45. Cypress, 828-9075. A

Kitchen Set, chrome, Formica top, table leaf & 4 chairs, $15. Hawthorne, 679-4365.

T-Bird, 1955, all powered, auto. floor shift, $1075. Inglewood, 673-0752. A

Ice Cream Set for patio or breakfast room w/table, arm chair, & 3 std. chairs, $90. San Pedro, TE 3-9455. A

Mercury, 1954, h/top, 56,000 act. miles, 1-owner, r/h, $200. Gardena, DA 4-5341. A

Chevrolet, 1962, 327 cu. in., AFB, Hurst 4-spd., 4.88's, chrome rims, Caslers, $1500. Redondo Bch., 379-9897. A

Apt., 3-bdrm. town-house, 2½ baths, dble. attached garage, pvt. laundry facilities, close to shopping & bus line, $30,500. Inglewood, 674-2371. A

Volkswagen, 1963, chrome wheels & hubs, radio, headrests, $1400. Buena Pk., 714-828-0268. A

Yamaha, 1964, 80 cc, rebuilt eng., good tires, $275. Gardena, 324-8450. A

Home, rustic charmer, 3-bdrm. or 2-bdrm. & convt., completely redecorated, fireplace, covered patio, dble. gar., carport, blockwall fence, $23,500. Hawthorne, OS 6-1985, DA 9-5126. A

Cabin Cruiser, 25' Esseness, 9½' beam, fiberglass, 2 inboard engines, $2000. Lawndale, 371-7311. A

Bicycle, 26" girl's Schwinn, $15. Inglewood, PL 6-7337. A

Organ, Baldwin model 40 Orga-Sonic w/percussion; Philippine mahogany w/matching bench, $695. Redondo Bch., FR 5-3914. A

Organ, Hammond chord, blonde w/percussion, will deliver, $350. P.V. Pen., 378-2369. A

House, 3-bdrm., 2 baths, lge. fenced yard & patio, near schools & park, kitchen built-ins, paneled bedroom/den & dining room, forced air, $23,000. La Mirada, 714-521-1516. A

Home, custom-built, 3-bdrm., 1¾ baths, built-ins, garden w/fruit trees, close to Northrop, $28,000. Hawthorne, 675-8829. A

Violin & carrying case, music rack, slide mute, chin rest, $80. Santa Ana, 549-2763.

Frigidaire, 1954, will guarantee 6 mos., $30. Long Bch., TE 4-7823. A

Saddle, lightweight western style, used a few times, light tan, horsehair pad, $50. Inglewood, 672-3802. A

For Sale

Apt. Bldg., deluxe 9-unit, 3-bdrm. owner's unit, yearly income of $12,500, $107,500. Torrance, 325-9832. A

Corvair, 1964, r/h, 110 hp, $1350. Hollywood, GR 8-3232, OL 6-3475. A

Acreage, lake frontage in No. Calif., 2 2½-acre parcels, $5750 parcel; 2 5-acre parcels, $9500 parcel. $500 down, 1% per mo. pymts. L.A., 476-1635. A

Bicycle, girl's, full-size, middleweight, blue, $15. Rolling Hills, FR 8-1863. A

Tools, 1" to 2" mike, 2" to 3" mike, (2) 24" scales & adjustable parallel blocks, $35. Gardena, DA 4-8853. A

Jeep, 1942 CJ2A Willys, windshield, $35. Torrance, 320-5846. A

Volkswagen, 1963, r/h, 2-dr. sedan, vinyl int., $1225. Hawthorne, 676-6134. A

Motorcycle, 1965 Triumph TR-6, $900. Inglewood, 674-1847. A

Volkswagen, 1965, sedan, 400 miles, warranty in effect, $1700. Fullerton, 714-871-5510. A

Chair set, 2, aquamarine, on casters, $50. Inglewood, OR 4-7743. A

Lots, 2 level, running springs, Deep Creek Lake area, ½ dn., terms, $3200. Diamond Bar, 714-595-3013. A

Washer, Kenmore auto., 2-spd., 10 cycles, $75. Torrance, 371-6328. A

Desk, solid maple, roll-out typewriter shelf, built-in bookshelves w/chair & fluorescent light, $150. San Pedro, TE 3-7306. A

Water Skis, children's dble., used once, $20. Lawndale, 675-0189. A

Wanted to Buy

Bicycle, Stingray, for small boy. San Pedro, TE 3-2512. B

Dress Form, size 14, Box 1702. B

For Trade

Winchester, model 12, 12 gauge will trade for Winchester model 12, 20 gauge. Whittier, 943-1361. C

FREE (To Be Given Away)

Windows, 3 dble. hung. Hawthorne, OS 6-1018. D

Rentals Offered

Duplex, 2-bdrm., free soft water, $125 mo. Hawthorne, OS 5-3866. E

Apt., 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

House, 3-bdrm., dble. garage, fenced yd., water & trash paid, no pets, $145 mo. Lawndale, 371-6775. E

Condominium Apt., 4-bdrm, 2½-bath, heated pool, play equip., quick freeway access., lease, $315 mo. Rolling Hills Ests., DA 5-5609. E

Apt., 1-bdrm., deluxe, built-ins, pool, $95 mo. Redondo Bch., 376-2117. E

Apt., 2-bdrm., closed gar., all extras, 10 mins. to Nortronics P.V., encl. yd., $110-$125. Torrance, 375-9397. E

Duplex, 2-bdrm., h/wood floor, gar., water paid, $125. Hermosa Bch., 376-3857. E

Apt., 2-bdrm., walking distance to Northrop, 2 bath, exec.-type, $125. Hawthorne, 676-9620. E

Apt., 2-bdrm., large, newly decorated, pool, $125 unfurn.; $140 furn. L.A., VE 7-4036. E

House, 3-bdrm., 1 child OK, $137.50 mo. Thousand Oaks, 495-3623. E

Apt., 2-bdrm., unfurn., enclosed gar., $87.50. Torrance, 373-1266. E

House, 3-bdrm. & family room, fenced yard, car port, children OK, walking distance Plt. I, $135 mo. Hawthorne, OS 6-6104. E

Cabins, Lake Gregory & Crestline, sleeps 6, $25 weekends, $60 wk. Venice, EX 1-2040.

Apt., 1-bdrm., unfurn., modern, refrig., air cond. 20 min. to Norair, $97.50. Mar Vista, 391-7781. E

Apt., 3 & 4 bdrm., open-beamed ceilings, fireplace, patio, air cond., 2 baths, many extras, from $125. Anaheim, 638-2877. E

Apt., furn., open gar. w/storage space, laundry facilities, 2-bdrm., 2 baths, water paid & trash, $140 mo. Inglewood, 672-5798. E

Rentals Wanted

Secretary willing to share furn. 2-bdrm. apartment w/1 girl. Inglewood, OR 1-5242.

Personals

Ironing in my home, 2 blocks from Eng. Science Ctr. Hawthorne, 675-8388. L

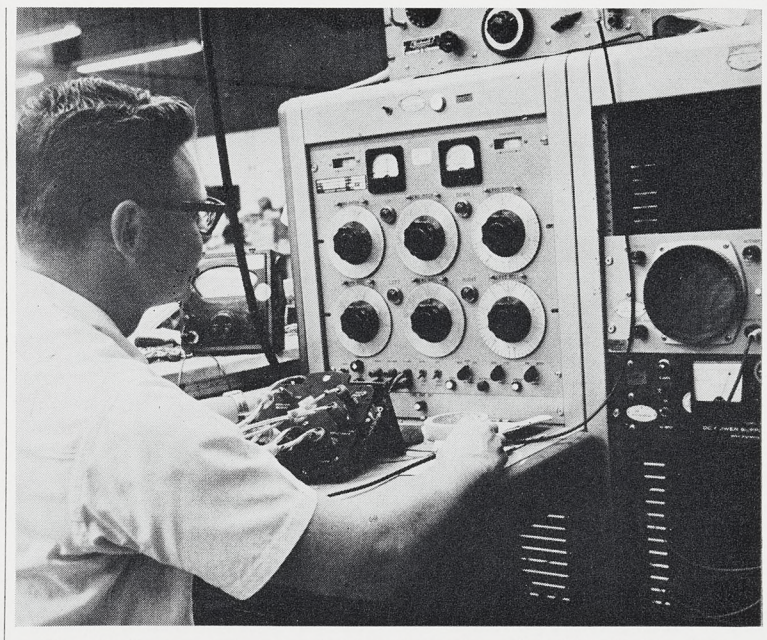
My Family & I wish to thank each & everyone of our dear friends at Northrop Norair who so warmly donated to the Heart Fund, the Physical Handicapped, flowers, Mass cards & personal letters in my husband's memory. We thank you. MRS. JOHN B. CLARK L

We wish to thank all Northrop people for their kindness during our bereavement in the loss of our son. V. E. FINNEGAN & FAMILY. L

For Sale or Trade

Refrigerator, Crosley-Shelvador, 11½', $25 or trade for camp cots & sleeping bags. Torrance, DA 6-5558. M

Chevrolet, 1956, auto. trans., '64 Chev. interior, good tires, $625 or trade for Volkswagen. Montebello, 722-7680. M



Work for Ventura includes production of decoder units which fit into drone radio control systems. Inspecting unit, Jack Mildon simulates command such as roll or pitch and makes sure it responds according to specifications.

INSTRUMENTS: Aero Offers Good Switch Without a Fight

(Continued from page 2)

and moving shutters, the device is about six inches long and weighs less than a pound. It can provide output signals to customer requirements without external amplification. Unlike potentiometer transducers, it operates with almost a total absence of friction, and it is not susceptible to overstress as is the strain gage type transducer.

In its application for the Maxson drone, it is used as an altitude sensing device for pressure altitudes up to 80,000 feet. The transducer can also be applied to measurement of temperature, acceleration, loading, force and displacement.

The design was brought to fruition during 1964 by Dick Hauer, instrument research engineer. Mr. Hauer, with the assistance of other technical personnel, brought it through development to the hardware stage.

The frequency converter, initially designed to meet the requirements of a Navy specification was also accomplished by Dick Hauer. The converter utilizes solid-state electronics and can be packaged to attach to standard meter movements.

When Ed J. Illes, Marketing manager, joined the facility in 1964 he increased the sales network. Agreements with 17 manufacturing representative firms, utilizing some 35 engineering sales representatives, were established.

Mr. Illes points out that the market for transducers is a multi-million dollar one — 60 million dollars for pressure transducers alone. In addition, the pressure switch market totals $20 million annually. The market for frequency meters, running time meters and frequency converters provides a note of stability that any firm desires. And Aero is reaching out for a bigger portion of these markets.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m.—3:45 p.m.

Western & Lomita Blvd., Harbor City. L. A. Pendleton, Norair, ext. 2006, 325-9264 2

Herrin & 1st St., Manhattan Beach. Elizabeth A. James, Norair, ext. 2075, FR 2-4762. 2

7:30 a.m.—4:15 p.m.

Van Ness & Redondo Beach Blvd., Gardena. Sandy Gostel, Norair, ext. 2401, 679-4269. 3

Manchester & Prairie Ave., Inglewood. D. W. Jurs, Mariposa, ext. 4121, 4122, OR 4-2672. 3

8 a.m. — 4:45 p.m.

Brookhurst & Garfield, Huntington Beach. Margaret J. McKenzie, Nor. Anaheim, ext. 651, 962-4903. 5

Compton Blvd. & Crenshaw, Gardena. M. L. Elliott, Norair, ext. 1712. 5

Carson & Avalon, Torrance. S. A. Sickler, Norair, ext. 4221. 5

Fairview & La Brea; La Brea & 64th, Inglewood. Louise T. McCulloch, Norair, ext. 2042, 672-2434. 5

Blossom & Mathews, Redondo Beach. Sue Dahlvang, NSL, ext. 720, 372-9585. 5

Hoover & Melrose, Los Angeles. J. F. Low or F. Almanja, Norair, ext. 1676, 664-6564. 5

Normandie & 107th St., Los Angeles. Dona Davis, Norair, ext. 1559, 1528, 755-2992. 5

Rides Offered

7:20 a.m. — 4:05 p.m.

Valley View & Chapman, Garden Grove. Will pick up & deliver at Plant I. Kenneth Goldenstein, Mariposa, ext. 4257, 897-2632.

7:30 a.m. — 4:15 p.m.

Crescent & Dale, Buena Park. D. H. Eaglin, NSL, ext. 2655, 2656, TA 8-2857. 13

8 a.m. — 4:45 p.m.

Hoover & Melrose, Los Angeles. J. F. Low or F. Almanja, Norair, ext. 1676, 664-6564. 15

PLACENTIA

(Continued from page 3)

This has led to many buildings following the Spanish motif.

And like other small communities, Placentia has its problems. For instance, encroachment by larger neighboring communities; traffic; thousands of new children; storm drainage problems; planning and landscaping; highways and freeways are all quite important to the community.

"Let's face it. We have an ideal community in an ideal setting," Jim Hock says. "We feel strongly that we can continue to grow and expand along the careful route we have followed in the past."

Chances are, this is just what will happen, thanks to men like Jim Hock who care enough to give of their own time to make it possible.

Jim is not alone among Nortronics Anaheim personnel with a vital interest in Placentia. Many employees live there and take an active interest in all endeavors. Harry Dunskey of Provisioning and Documentation is currently chairman of the Planning Commission, while E. P. Weidner of Configuration Management is a Parks and Recreation Commission member.

Army Guests Hear Latest On Software

Northrop Nortronics put its eight years' experience in generating automatic test equipment software on the line recently for a dozen engineers who will direct programming tasks for U.S. Army Missile Command (MICOM) test equipment.

The experts from MICOM, which is headquartered at Redstone Arsenal, Huntsville, Alabama, were joined by a civilian engineer from the Army Electronics Command at Fort Monmouth, New Jersey, for the week long symposium at Anaheim.

Paul Potts was chief host for Nortronics, and six other engineers from the Automation Systems section made presentations during the 40 hours of exchanging data which concluded September 14.

The Anaheim meeting was another in a series for the MICOM engineers, who have participated in a number of other symposiums hosted by defense contractors, in an effort to collect the most comprehensive information available on software support of test equipment.

When MICOM selected Nortronics as a symposium leader, it chose a group which is two years ahead of the state-of-the-art in software support, based on findings of a recent analysis by Automation Systems section.

According to Don Miley, chairman of the programming committee for MICOM software programs, the importance of software cannot be overemphasized.

EARNINGS

(Continued from page 1)

for the quarter totaled $83,430,000, compared with $82,559,000 in the prior year.

The company's sales backlog at the close of the fiscal year amounted to approximately $288,000,000 as compared with $423,000,000 a year earlier. The year end backlog figure, however, does not include approximately $100,000,000 in aircraft contracts already in work and for which government funding has been provided, but negotiation of which was deferred beyond the end of the fiscal year, according to Mr. Jones.

READY FOR LAUNCH—Northrop Ventura's MQM-57B surveillance drone is poised for photographic mission behind enemy lines in training exercise by U.S. Army. Since 1959 the vehicle, originally designated the SD-1, has been used for tactical deployment around the world by U.S. forces.

DRONES: Specialized Surveillance Techniques for Field Commanders

(Continued from page 1)

When he retired from active duty in 1964 he joined Northrop Ventura's long range planning staff.

"Since Northrop Ventura is prime contractor for the only surveillance drone presently issued to U.S. troops, we are obliged to search for means of improving the system's performance," Colonel Murray said.

Program Manager Hank Campbell, Project Engineer Paul Lawrason and Colonel Murray are studying such items as improving all-weather sensing capability, guidance system, reduction of time required for data to get in the hands of field commanders, and others which involve the contributions of subcontractors as well as Northrop.

The complete USD-1 system includes hardware produced elsewhere such as a camera, ground tracking and control (radar and radio) and mobile laboratory for processing film.

The vehicle is powered by a four cylinder, air-cooled McCulloch engine, has a speed of 184 miles per hour, an altitude of 15,000 feet and a fuel capacity for 40 minutes.

Night photos can be taken by releasing flares at selected intervals.

In addition to U.S. deployment of the systems in Europe and the Far East, the surveillance drones have been supplied to the British Army and Italian forces. They are also used at the Fort Huachuca's combat surveillance school for training purposes.

It takes a crew of five to operate the system which can be set up and launched quickly in rough terrain from a camouflaged position. Drones are usually operated by a specially trained section of an Aerial Surveillance and Target Acquisition Platoon (ASTAP) which, in turn is part of an Aviation General Support Company of the Division's Aviation Battalion.

A plot board in a mobile radar van is the ground controller's "eyes" in steering the vehicle after it is out of sight. A preplanned flight path is matched with the drone's actual flight as indicated by radar, and the controller brings the drone to the right or left and changes altitude as needed to keep it on course by operating knobs on a radio-control box.

The ground controller pushes a button to activate the camera, which shoots a series of overlapping photographs until shut off. The drone is then returned and recovered by parachute at a location near the photo developing van.

"The MQM-57B is small, fast and it gets in and out in a matter of minutes," Colonel Murray says. "I have watched ground troops try to shoot it down without success. Improvements now in the works on guidance and sensors will make it a sound basic system for battlefield surveillance."

MEETINGS

Exotic Metals: A Burden on Designer

Use of exotic materials in aircraft and aerospace vehicles may require a systems engineering approach in design and manufacture because of complexities involved in the present early stages of development.

A Northrop paper presented this morning at the Society of Automotive Engineers Aeronautic and Space Engineering and Manufacturing meeting emphasized the importance of this systems engineering approach and of close liaison between designers, processors and fabricators utilizing exotic materials.

The paper was presented jointly by Norair's Dr. Eugene W. Emmerich, supervisor of Metallic Research; E. D. Jacobs, Supersonic Transport project chief; and Dr. Richard L. Jones, director, Research and Technologies, during the third day of the SAE meeting at the Statler Hilton Hotel.

Eleven other Northrop engineers and scientists are participating in the five-day engineering and manufacturing meeting.

Exotic materials are defined as those that can withstand a thermal environment that aluminum is incapable of withstanding. These substances range from titanium through the refractory materials and into the ceramics.

"The current trend to exotic materials," the paper continued, "has and will continue to place a greater burden on the airframe designer.

"In the past he has been accustomed to designing in aluminum, and his experience allows him to design without an extensive amount of coordination with Material and Manufacturing personnel. In essence he has had control of the design by knowing the limitations of aluminum alloys.

"This empirical knowledge, gained from experience, does not exist for most of the exotic materials."

Northrop has been involved in several programs related to the optimization and utilization of modern exotic materials. Brazing of molybdenum and Rene 41, hot forming of titanium alloys, machining of titanium and super alloys, titanium welding, and adhesive bonding are among the processes investigated.

MEN'S SCRATCH LEAGUE LAUNCHES NEW SEASON

Wes Steyer and George Douglas of Team Seven paced Northrop Ventura bowlers September 14 with a 583 and 530 series respectively but Team Five, paced by Joe Montrose's 525 series, took over first place at the opening of the men's 630 Scratch League at Conejo Village Bowl.

Team Five, which also includes John Kerr, Ralph Friesen and Larry Carroll, held on to a slim lead at the end of the second week of play and Team Seven, which includes Bill Higgenbotham and Hal Dudley, is now in third place.

Team Three, consisting of Dick Hull, Jeff Stiles, Doug Sessions, and Dick Tupper, moved up from fifth place to second during the second night of action September 21. They now trail by only one pin.

Ten teams are entered in the competition in this the second year of scratch play sponsored by Northrop Ventura Recreation Club.

In the September 21 action, Hugh Daly posted the best individual record with a high game of 247 and a 610 series, followed by Clarence Mapes with a 211 high and 581 series, and Harold Bixby with a 215 high and a 567 series.

The league bowls every Tuesday night.

SATELLITE

(Continued from page 1)

environment. Mission requirements call for the satellite to collect and transmit the derived data for a period of one year in orbit.

Primary objective of the Titan flight is to test complete system performance of the mighty Martin space booster, most powerful ever launched by the Western world. By placing the OV2-1 aboard the Titan III-C the USAF expects to obtain valuable scientific data as a space research bonus.

The OV2-1 program is one of the first to be implemented with the requirement of utilizing proven, off-the-shelf hardware for subsystems as a means of improving reliability and reducing costs. It is also one of the first satellite programs to be performed under a fixed price contract.

AMCEL

(Continued from page 1)

said, "and they form the nucleus for our long-range growth plans for the company."

Mr. Jones also expressed satisfaction with the Asheville location pointing out that it provides convenient contact with the Northrop Space Laboratories at Huntsville, Alabama, and with several Department of Defense facilities in the eastern and southeastern United States.

The Amcel facilities, comprising some 30 buildings and laboratory units located on a 1300-acre site, has been operated as a Corporate division of Celanese. Amcel has some 400 employees.

NORWEGIAN F-5 BEGINS TESTING AT EDWARDS

The first Northrop F-5 scheduled for delivery to the Royal Norwegian Air Force in the spring of 1966 was turned over to a joint U.S. Air Force and Norwegian evaluation team for testing last week at Edwards AFB.

The RNoAF F-5 tactical fighter is scheduled for accelerated service testing and climatic tests through early 1966, with certain RNoAF options, including a tail hook, inlet duct and windshield heating.

In early 1964 the Norwegian Ministry of Defense decided to equip the Royal Norwegian Air Force with Northrop F-5 tactical fighters, after extensive evaluation of U.S. and other first line aircraft.

Procurement of three squadrons of F-5s are planned for delivery between early 1966 and 1967.

EYES HAVE IT

You can't trade your eyes if you get hit by a flying chuck key, but you can trade in your safety glasses, Kenneth Mah of Northrop Ventura's plastics shop says. Tool crib chief Melvin Turner (rear) issued new set of safety glasses for broken ones.

Ventura Recreation Club Good Time Table

For enrollment or information on activities listed below, call or contact Recreation Club, Ventura, ext. 480.

ARCHERY, Dale Milligan
Meet 1st Sunday, 10 a.m., Balboa Park Recreation area, Encino. Beginners with or without equipment welcome to free instruction.

BOAT, Gus Johnson
Meet 1st Thursday, 7:30 p.m. DAV Hall, 6543 Corbin Ave., Reseda.

BOWLING, Zack Silvers
Teams compete in mixed leagues on Thursday evenings at Conejo Bowl, and Friday evenings at West Valley Bowl. No formal meetings.

BRIDGE, Tammy Tracy
Weekly bridge games at lunch period in cafeteria.

CAMERA, Dan Cashier
Meet 1st Monday, 7:30 p.m., 18146 Sherman Way, Unit 7, Reseda.

GOLF, Ron Morin
Monthly tournaments on announced dates with meeting at time of tourney.

RADIO, Bob Holly
Meet 1st Wednesday, 11:45 a.m. to 12:30 p.m., Engineering conference room 166. Amateur station is in ham shack at NV antenna range and is available noon hours to licensed amateurs.

RIFLE & PISTOL, Joe Letteriello
Meet 4th Sunday, 7 a.m., Camp Pendleton Range. Compete in Valley league tourneys and fields top marksmen in state and regional matches.

ROCKHOUNDS, George Rigby
Meet 2nd Friday, 8 p.m., 18146 Sherman Way, Unit 7, Reseda, to plan field trips and to use Club lapidary.

ROD & GUN, Dorothy Prychoda
Meet 3rd Tuesday, 8 p.m., DAV Hall, 6543 Corbin Ave., Reseda.

SPORTS CAR, T. F. Twitchell
Meet 1st Tuesday, 7:30 p.m., DAV Hall, to plan regular competitive events which occur on 3rd weekend of each month.

TENNIS, Bob Reese
Meet Wednesdays, Los Posas Country Club courts, 5:30 p.m.; Balboa Park courts, 6 p.m.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California | Vol. 23, No. 18 | October 20, 1965

Vietnam Squadron Completed

The last two of a squadron of 12 F-5 fighters scheduled for Vietnam duty this fall have been delivered from Northrop's Palmdale facility to Williams Air Force Base, Arizona. The complete squadron is now engaged in combat exercises at Williams.

Secretary of Defense Robert S. McNamara last month announced the squadron would be sent to Vietnam to obtain in combat more information to be used in developing tactical air concepts, procedures, tactics and techniques for employment of F-5's in combat.

The program for readying the aircraft for its combat role was described by Norair Vice President Welko Gasich as "one of the most outstanding and dedicated efforts I have seen."

Major changes include an in-flight refueling capability, a camouflage paint job and jettisonable pylons.

One of the most significant aspects of the program, as pointed out by the Northrop Air Force Plant Representative's office, was the accomplishment of the task by Northrop in an unusually short period of time while maintaining production schedules on deliveries to Allied Forces under the Air Force's Military Assistance Program (MAP).

In a statement reporting Northrop's work in preparing the airplanes the AFPRO said:

"To meet this program's urgent time requirements the 12 F-5 airplanes had to be immediately diverted to the project from the company's production line . . . To close the production gap thus created and to continue to meet stringent MAP delivery commitments required a rapidly accelerated manufacturing schedule to be implemented.

"The Vietnam squadron of airplanes has now been delivered to the USAF while other produc-

(See COMBAT, page 6)

YOUTHFUL INTEREST IN PLASTICS

Students from Oxnard High School tour Plastics Shop at Northrop Ventura as part of vocational program jointly sponsored by school and Northrop. Wes Mace (right) describes techniques used in production of F-5 and T-38 components, such as fuel cell in photo. In addition to conducting tours of the plant, the Division provides volunteer instructors for evening vocational classes at the school.

RENDEZVOUS SET BY GEMINI SIX

Astronauts Walter M. Schirra and Thomas P. Stafford will attempt the first full scale rendezvous experiment when Gemini 6 is sent aloft later this month for a two-day mission.

Astronaut Schirra, who has already felt the tug of a Northrop Ventura parachute landing system once as a Project Mercury pilot, will be in command.

The mission will also be the first dual launch from Kennedy Space Center. An Atlas booster will put an Agena rocket into orbit to be followed by a Titan booster lifting the Gemini capsule. The primary mission objective is a rendezvous between the two.

Steyer, Simpson Earn 20-Year Pins; 16 Others Honored For Long Service

Wes Steyer and Lloyd Simpson became eligible for 20-year service pins this month while 16 other Northrop Ventura employees marked their 15 and 10 year anniversaries with the company.

Mr. Steyer is program manager for the Apollo Earth Landing System. Since joining Northrop in 1945 he has been a project engineer on various aircraft subcontracts at Norair Division and a research analyst and designer on such programs as the B-49 and F-89 aircraft.

He has been with Northrop Ventura since 1962, including an assignment as assistant to the vice president — Technical. A registered mechanical engineer in California, Mr. Steyer is also an active member of the AIAA.

He will receive his pin October 22 from George Douglas, Corporate vice president and Division general manager.

Mr. Simpson is supervisor of the Apollo Technical Support unit at El Centro, where he is responsible for engineering coverage of Apollo landing system qualification tests.

He worked on the Flying Wing program and development phases of the Snark missile at Hawthorne prior to 1954 when he was assigned to Northrop Ventura field support staff for various target drone programs.

He was presented his diamond studded pin October 8 from Northrop's base administrator at El Centro, Con Harley.

Honored at Newbury Park for 15 years of service this month were Ray Escott and Henry Robinson, who received pins from their respective department managers.

Ten year awards went to: Willard Bryan, Barbara Forbes, Russell Rundgren, Lou Florence, Robert Tracy, Anthony Fortuna, Grady Means, Edward Kepka, Edith Weber, Delbert Brummet, Eunice Olson, Robert Bradford, Beverly Tominello, and Dorothy Helm.

Mr. Steyer

Mr. Simpson

FIRE PREVENTION WEEK

Brigade Gives Command Performance

Northrop Ventura's fire brigade observed National Fire Prevention Week earlier this month (October 5) by starting a few fires and putting them out.

While it was a regular monthly training session, the brigade invited Captain Dick Wilson and his men from the Newbury Park fire station over for an afternoon of local participation in the nationwide observance of Fire Prevention Week, October 4-11.

Photos on Page 6

Working in the training area behind the Division's Manufacturing building, the brigade went through routine maneuvers with three different types of fires — flammable materials, flammable liquids and magnesium.

Eleven members of the Production Machining group, which works with magnesium on a regular basis, attended the demonstration in addition to the 25 brigade members and plant security officers. The Northrop teams demonstrated what happens when water is poured on magnesium fire — a volatile reaction — as well as the proper methods of extinguishing such blazes with a Northrop-developed T.C. powder.

The Northrop brigade system, under the direction of Plant Protection Supervisor John Steman, went into effect last April after more than a year of planning and training. The brigade's primary purpose is to provide initial response in an emergency prior to arrival of Ventura County Fire Department units.

Recently added to the brigade's inventory of equipment is a drafting pump, which could be used to draw water from man-made pools which dot the Division's landscape. A hose cart, power generator and auxiliary equipment are the brigade's principal items.

One new brigade captain has been added to the initial list. Chuck Taylor has replaced John Curnow who moved to Nortronics Division. Other captains are Ray Escott, Dale Gilmore, Joe Sliakis and Warren Sneed.

Space Center Task Force Backs Apollo

A Northrop Ventura task force has arrived at Kennedy Space Center to provide on the spot technical support of the Apollo earth landing system, it was announced this month by Wes Steyer, Northrop Apollo ELS program manager.

Cary Buhler, Northrop project engineer, heads the force of six specialists who will be responsible for packing, final assembly and delivery of the Apollo Spacecraft 009 earth landing system to North American Aviation's Space and Information Division, prime contractor for the spacecraft.

Spacecraft 009, the first test of the Apollo spacecraft system at Kennedy Space Center, is an unmanned, suborbital flight scheduled early next year. Previous qualification tests have been held at White Sands, New Mexico, and El Centro, California.

"Owing to the urgent need for completing the parachute packing and end item delivery at Kennedy Space Center within a condensed and exacting schedule, the specialized organization has been established to assure timely and efficient technical support," Mr. Steyer said.

This approach is different from the Gemini program in which final delivery of the landing system is made at Northrop Ventura, with the prime contractor, McDonnell Aircraft, responsible for packing and installation. Northrop provides field support to McDonnell to pack the chutes.

But, for the Apollo program,

(See APOLLO, page 6)

'Walk In Space' Book On Sale by NVRC

Copies of *Gemini, America's Walk in Space* are available to Northrop Ventura employees in the cafeteria during lunch time, by arrangement of the Northrop Ventura Recreation Club.

The books were obtained when a number of requests from employees were received. The Ventura Division's role in the NASA space program includes preparation of parachute landing systems for Mercury, Gemini and Apollo.

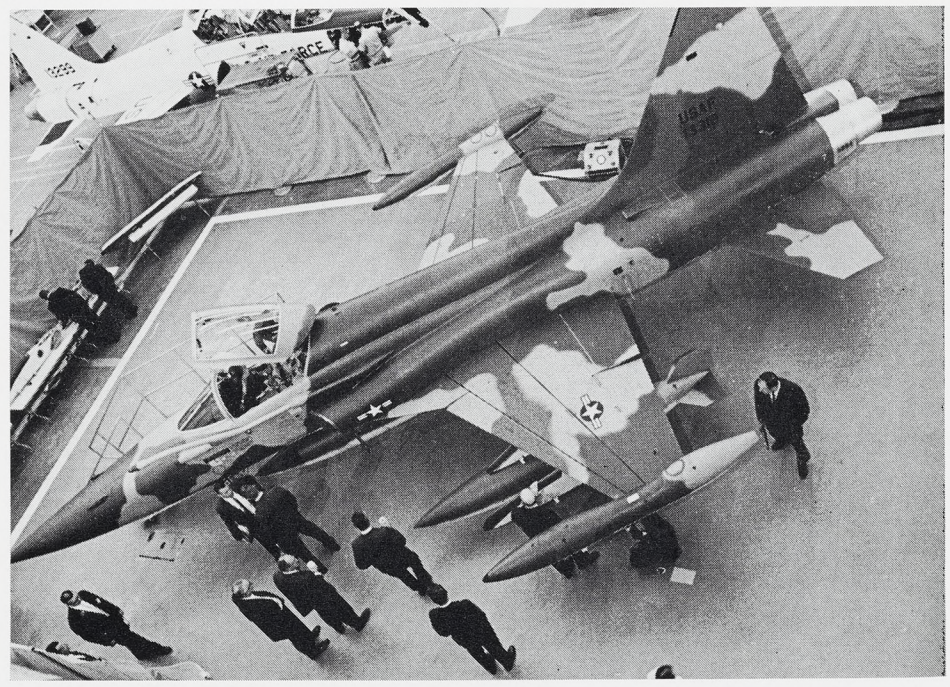
Priced at $2.50, the book was prepared by United Press International and published by Prentice-Hall, Englewood Cliffs, New Jersey, 1965.

Free Lunch Offered As Weekly Prize

An employee number posted on one of the 12 Northrop Ventura cafeteria bulletin boards devoted to NVRC activities will earn for its owner a free lunch in the cafeteria, the Northrop Ventura Recreation Club, has announced.

A new number will be drawn and posted each week and the winning employee can claim his lunch any time during that week by showing his badge. The winner can eat as much as he wants.

Vietnam-bound F-5s have in-flight refueling capability as practice session with tanker jet above indicates. Capability was added during modification effort.



Air Force Critical Design Board goes over F-5 following completion of modifications at Palmdale. Camouflage paint is standard with combat planes for Vietnam.

The People Behind the Story

By BRYAN WEICKERSHEIMER
News Staff Writer

C. B. Nichols, above, lays out job in Norair Advanced Production, where majority of modification parts were fabricated. Dovie Ross, below, answers one of many telephone calls at Palmdale during program. Northrop people did remarkable job readying planes in short time.

A few days ago I received a routine assignment — write a feature story on the men and women responsible for readying a squadron of F-5 tactical fighters for a combat role in Vietnam.

I soon learned there was nothing routine about the subject.

And I must admit my guilt in going overboard in my admiration for an effort like few I have encountered in more than 15 years of aerospace reporting.

Lew Nelson, deputy program manager, gave me my first inkling of something different in a brief outline of the program. Sherm Turner took me further into its scope, extent and depth. He refreshed my memory of a program called Sparrow Hawk in which the F-5 was evaluated under simulated tactical conditions. He explained how this evaluation and a lot of other factors were used to determine the F-5 configuration for the Vietnamese program.

There were 44 modifications to be made. Some were relatively simple. Others were more complex, like adding aerial refueling capabilities, armor plate, and jettisonable pylons.

If there was one factor in the program that impressed me, it was the timing. As talks continued and decisions were made, the go-ahead dates gradually slipped while the ultimate delivery dates were advanced. It was like a noose being pulled ever tighter.

The final authorization was given July 29. The last airplanes were delivered October 11. In any man's language, that is a truly remarkable accomplishment.

Further complicating the matter was the understanding that Northrop would not interfere with its delivery of F-5 aircraft to allied nations.

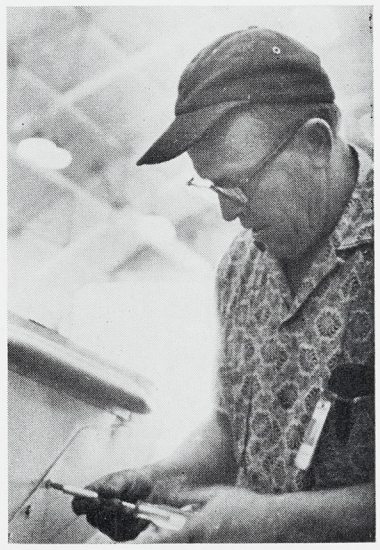
Northrop's Technical organization did a tremendous job in performing engineering work under the able guidance of such men as Will Tebo, John Wolfe, Doug Stephens, Chal Strayer, Al Rosin, Ralph Branning, Roy Merriman, Stan Murnane, Tom Rooney, Carl Weyl and Joe Bligh. Engineering Laboratories replied promptly to assist requirements with Vern Cole, Sherman Lew and Joe Wilson in key assignments.

Fabrication of parts from drawings fell primarily to the Advanced Production and Weld group under Wayne Morrison. This group also supplied technicians to help with modifications at two points. Technicians were also diverted from Manufacturing units under Superintendent Al Carr.

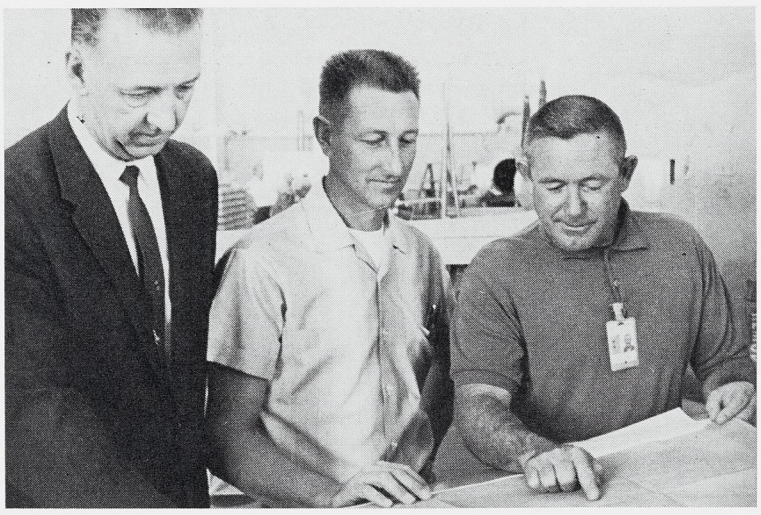
Nortronics Anaheim responded with jettisonable pylon work.

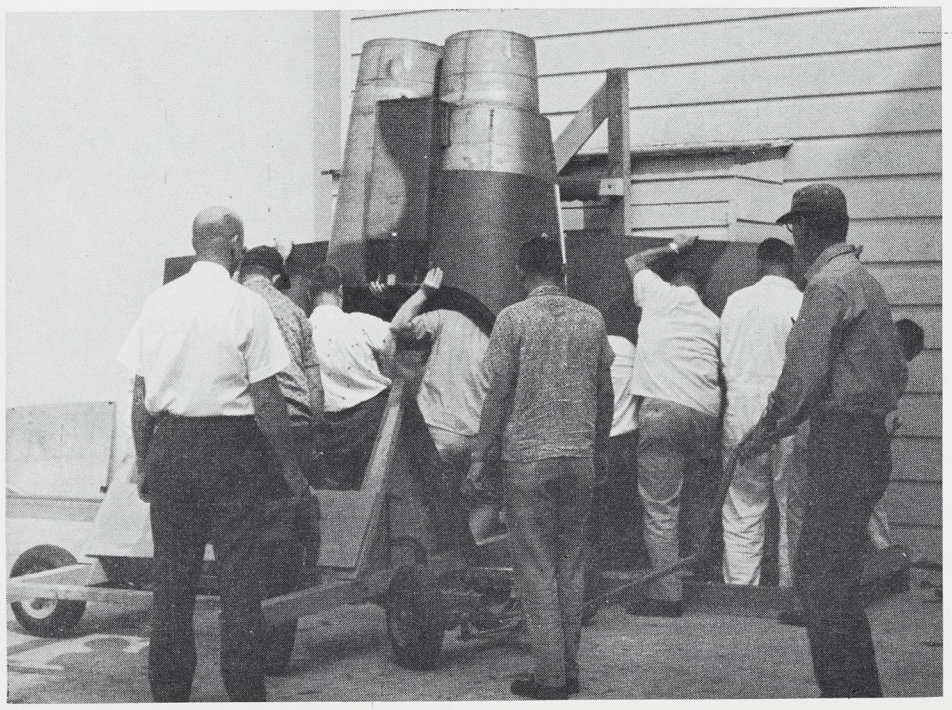
Modifications were made at Palmdale under direction of Base Administrator Tom Mc-

(See VIETNAM, page 5)



Kenneth Petersen, above, works on pylon at Norair, where design effort, production of modification parts was centered. Wally Johnson, Ron Wyatt, John Vilarino, below, were key figures in program at Palmdale. Many men, women, contributed to program success.





Northrop Norair men gently lift boattail assembly into shipping fixture. It was bound for Vietnam as part of extensive logistics effort in which Northrop helped.

Smaller spare parts for the F-5 were gathered at central point, routed on to Vietnam to support operations of 4503rd Tactical Fighter Squadron.

Gillibrand Wins Kiwanis Award; Elected to Office

Joseph C. "Whitey" Gillibrand, Northrop Norair superintendent of Maintenance, has been twice honored for his Kiwanis Club activities.

In annual elections held by the Hawthorne Kiwanis Club, Mr. Gillibrand was named first vice president with installation to be held in January. He has served for the past year as second vice president and prior to that was a member of the board of directors.

During September, Mr. Gillibrand also received a Distinguished Service Award for exceptional service as chairman of the Golden Anniversary Committee marking 50 years of Kiwanis Club operations.

His award was based on international competition in which his presentation was judged best in the entire state of California. It is the first such award known among local Kiwanians.

Don Lutz Named To Corporate Post

Don Lutz has been named director of Corporate Accounting, it has been announced by J. Grant Macdonnell, Corporate vice president and controller.

Mr. Lutz, a 14-year Northrop veteran, has been director of Finance at Northrop Space Laboratories since 1962. He has served as chief of Accounting and Budgets at Nortronics and as head of General Accounting at Norair during his long career with Northrop.

He is a graduate of the University of Southern California and is a certified public accountant.

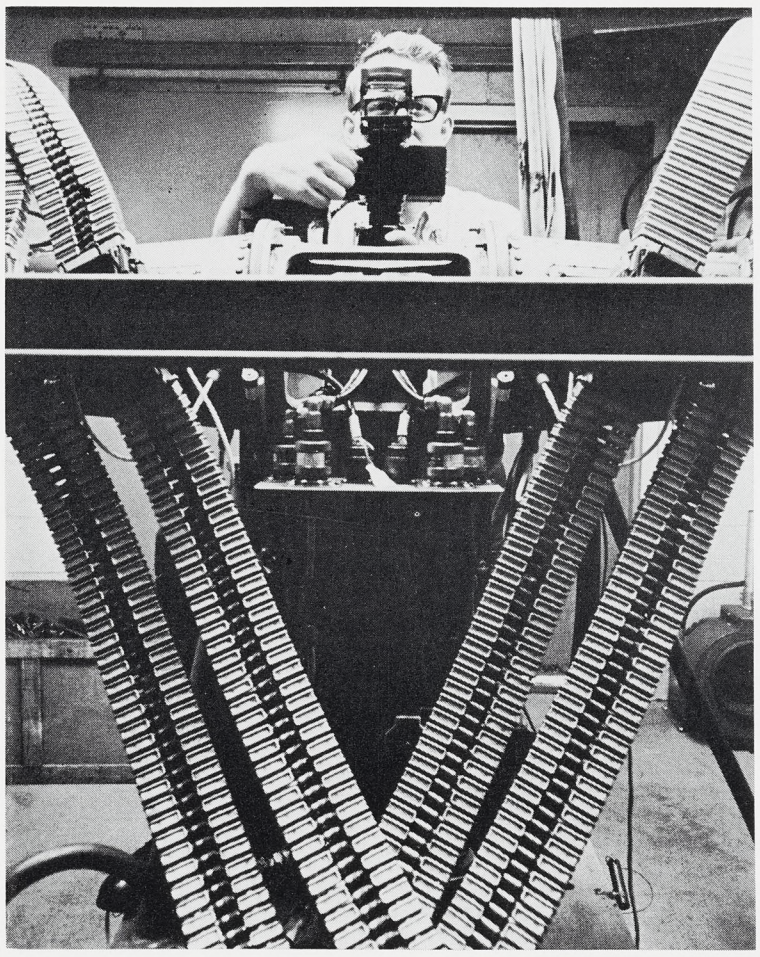
Free Trip to Hawaii Part of NRC Holidays

A free trip to Hawaii will be awarded to a paid-in-full member of the Northrop Recreation Club Christmas holidays Hawaiian tour, Jeanne Andrecht, Nortronics Hawthorne travel commissioner, has announced.

The free trip will be given by arrangement of Surl Kim of Kim Tours, the organization in charge of the December 24 to January 2 trip, with eligibility dependent on being paid up by the first week in December.

Reservations are still available from Northrop Personnel Activities offices, with the total tour price set at $378.

MACHINE GUN LINEUP



While a squadron of F-5's was being readied in California for Vietnam action, production was continuing at Needham Heights, Massachusetts, plant of Nortronics Marine Equipment Department on helicopter armament subsystems. Under a $2.6 million Army contract awarded in 1964, the four machine gun-system was designed to meet Army helicopter needs in Vietnam.

ZD DAY MEMENTOS PRESENTED ANDERSON

California Lieutenant Governor Glenn M. Anderson was presented with several special Northrop Zero Defects mementos late last month in appreciation of his participation in Northrop Norair's successful ZD kickoff ceremonies held in June of this year. T. L. McCarthy, Norair manager of Administration, and D. N. Petersen, Zero Defects Program director for the Division, made the presentations.

Lieutenant Governor Anderson was an active participant and a principal speaker at Zero Defects Day ceremonies in Hawthorne on June 22. At that time he made a special request to be kept informed of the program's progress and results.

In their visit to Mr. Anderson's Los Angeles office, Mr. McCarthy and Mr. Petersen also gave the Lieutenant Governor an informal briefing on the progress of the ZD Program at Norair.

The great number of C.A.R.E. (for Cause and Removal of Error) letters, submitted by employees at the invitation of company management, was discussed and Mr. Anderson was told about the many important and helpful suggestions contained in these letters. Also discussed were Norair management's continuing efforts, under the personal direction of General Manager Richard E. Horner, to review each letter and to apply workable ideas from them to daily company operations.

Mr. Anderson was presented a model of the Northrop-built F-5 tactical fighter, a special Northrop Zero Defects desk set, and a photographic booklet covering important phases of the Zero Defects Program. He also viewed a motion picture of filmed highlights of Zero Defects Day.

BUT HORSES STILL NEEDED

NRC Radio Club Handles Emergency

Northrop Ventura's Radio Club is sharing credit with horseback message carriers in a recently completed communications emergency.

A local telephone call to Bob Holly, Club commissioner, triggered a chain of events which involved the highway patrols of two states, the West Coast Amateur Radio Service, and the Nevada Forest Service.

The call reported that an elderly woman, a friend of the Hollys was in serious condition following a fall. Her only relative worked on a ranch in a remote section of Nevada. There was no phone service to the ranch and it was miles from the nearest highway.

Mr. Holly radioed the message to the West Coast ARS which relayed it to the California Highway Patrol. The next link was the Nevada Highway Patrol which radioed the Nevada Forest Service at Gold Creek.

Two teenage girls volunteered to take the message by horseback to the ranch, five miles away. Three hours and 20 minutes after Mr. Holly got the initial call the message was delivered.

Such emergencies are routine with ham operators, Mr. Holly said, and there is a special frequency for handling them. Called the Emergency Traffic Net, it is monitored by the Ventura Club each day at lunchtime in the NRC radio shack.

Unusual stories are the order of the afternoon after Club members tune in on the net.

Mr. Holly described one occasion when a ham operator had car trouble on the freeway. He tried without success to contact the Los Angeles Police Department. So he raised a fellow ham in Oakland and explained his problem.

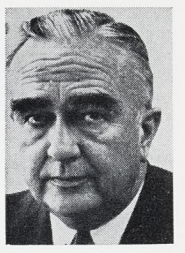
The Oakland ham called the police department there who in turn called Los Angeles police. A squad car was on the scene in minutes.

On another occasion, Mr. Holly attempted to contact his son, a marine stationed at Twenty-Nine Palms, California, to inform him of the death of a close friend. Because the antenna was pointed in the wrong direction, he couldn't reach the nearby desert base, but was receiving Hawaii loud and clear.

So, like any enterprising amateur operator would do, he asked the gentleman in Hawaii to call the base. A couple of minutes later he received an acknowledgement that the message had been delivered.

FRINGE BENEFITS

Employees Laud Disability Plan

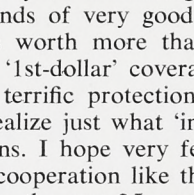


by WILLIAM LARRABEE
Vice President—Industrial Relations

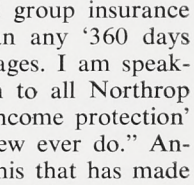
In the last issue of the Northrop News I said that I was going to discuss our various fringe benefit programs. Each of our benefits interests us all but, certainly, one which affects most of us at one time or another is our group insurance.

A vital part of any program is the way in which it is administered. The best of programs can fall short of doing the job for all of our people unless it is handled by administrators who know their business and who are dedicated to the principle that individual problems must be handled in such a way that the person involved gets the best possible treatment within the limits of the program.

After management has approved a program, someone then has to put it into effect and do the day-to-day job. In Group Insurance we have two men handling the work who are tops in their field and who are backed by highly competent staff personnel. Guy Mahan at the Corporate office arranges the purchasing of all of our insurance for us. Guy has been with Northrop for 23 years and reports directly to the vice president and controller. When any of us has a group insurance claim he goes through William "Bill" Waldon. Bill has been with Northrop for 11 years and works for Corporate Industrial Relations. He and his people have their offices at the Hawthorne facility and his door is always open to discuss any claims problem and to help us handle our group insurance claims to our best advantage.



Mr. Waldon



Mr. Mahan

So much for the people to whom we look to do the job for us. Let's take a look now at a few of the individual benefits. I can't cover them all in this article, but one of which we have every right to be proud as a Northrop "first" for our area is what we call our "long term disability coverage". After the prescribed waiting period, a Northrop employee who is covered by the over-all Northrop Corporation plan and is totally disabled is paid up to 60 percent of his or her gross base compensation, though not over $200 per week. This payment is made regularly until the employee reaches age 65 as long as he is "totally disabled" as defined in the insurance policy. The total cost is paid by the company. The details of the plan are set out in your Group Insurance booklet on page 21.

Most of us give very little thought to the possibility of our being disabled until we are hit by a catastrophe — and without this coverage it could be a real catastrophe. Bill Waldon has received letter after letter on this subject. One of our people wrote, "I have just received my first check from long term disability. What can I say? We are so appreciative of such a plan. To tell you the truth, when the memo was circulated I didn't give it a second thought. Who's going to need that kind of coverage? Little did I know I would probably be one of the first." Another letter read, in part, "Little did I think . . . that I would personally be benefitting because of total disability . . . I have seen all kinds of very good group insurance plans but long term disability is worth more than any '360 days room and board' or other exotic '1st-dollar' coverages. I am speaking personally. However, it is a terrific protection to all Northrop employees. I am sure very few realize just what 'income protection' (long term disability) really means. I hope very few ever do." Another disabled man wrote, "It is cooperation like this that has made Northrop a good place to work for the past 25 years. I look forward to the day when I may again join the Northrop fine working force."

Right now there are 99 people who are being saved from catastrophic problems through our long term disability program. Sixty-eight more who have drawn money under the plan have recovered and returned to work. Most of us know some of these people. I think that we have every right to boast a little bit about filling such a real need.

In my next article I am going to cover some further group insurance benefits.

Big La Jolla Trip On Tap for Netters

That "big" event of the year of the NRC Tennis Club—the trip to La Jolla on November 6 and 7—is at hand with deadline for reservations this Friday, October 22.

This is the fourth annual visit of NRC netmen to the La Jolla Beach and Tennis Club, a showplace of the Southland. Last year 100 took part in a similar trip.

Reservations are available for a variety of accommodations, with reasonable rates for all. There will be such extra added attractions as a group dinner, night club visit, golf, baby sitters, etc.

And NRC players will square off against a host team at 1 p.m. Saturday and 10 a.m. Sunday. Events will include both men's and women's doubles and mixed doubles.

Detailed information is available through Personnel Activities where reservations will also be accepted, NRC Commissioner John Potts reports.

NORTHROP NEWS

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E-Z SHORTHAND COURSE TO OPEN AT HAWTHORNE

A new "E-Z Speedy Shorthand" course will open at the NRC Clubhouse at Hawthorne for a six-week (12 sessions) period and is open to Northrop personnel in the Hawthorne area.

Personnel Activities, in conjunction with Personnel Development and Training, has made arrangements for the course.

Total cost is $3 per person, including text and materials. No previous shorthand knowledge is required for this new alphabet simplified system which provides a shorthand foundation for most dictation requirements.

Classes will meet from 5 to 7 p.m. Mondays and Thursdays during the six-week period.

Those interested may enroll by paying their course fee at Norair's Personnel Activities office or the Personnel office at Nortronics Hawthorne.

Test Society Honors Two From Norair

Two Northrop Norair men, Dan O'Halloran and Ed Regalado, will be singled out for special recognition during the 25th National Convention of the Society for Non-Destructive Testing to be held October 17-21 at Detroit.

Mr. O'Halloran, Norair's chief of Quality Control, is the Society's first candidate for national secretary to be selected by the general membership. He has served as a national director for three years, chaired the Transportation Division of the Technical Council, and coordinated publication of "Materials Evaluation," official Society journal.

Mr. Regalado, Norair general supervisor of Quality Control Engineering, will accept the President's Award for excellence in section management. This award goes to the Los Angeles section for which Mr. Regalado has served as president for the past year and a half.

009 TASK FORCE

Northrop Ventura task force has arrived at Kennedy Space Center, Florida, to provide support for Earth Landing System portion of Apollo Spacecraft 009, scheduled to be launched early next year. An unmanned flight, Spacecraft 009 will be the first from the Space Center. Huddled around parachute packing equipment above are (from left) Cary Buhler, Bill Downs, John Simpson, Don Severs, and Tasswell Payne.

SYSTEMS APPROACH CONSIDERED IN USE OF EXOTIC MATERIALS

Use of exotic materials in aircraft and aerospace vehicles may require a systems engineering approach in design and manufacture because of complexities involved in the present early stages of development.

A Northrop paper presented October 6 at the Society of Automotive Engineers Aeronautic and Space Engineering and Manufacturing meeting emphasized the importance of this systems engineering approach and of close liaison between designers, processors and fabricators utilizing exotic materials.

The paper was presented jointly by Norair's Dr. Eugene W. Emmerich, supervisor of Metallic Research; E. D. Jacobs, Supersonic Transport project chief; and Dr. Richard L. Jones, director, Research and Technologies, during the third day of the SAE meeting at the Statler Hilton Hotel.

Exotic materials are defined as those that can withstand a thermal environment that aluminum is incapable of withstanding. These substances range from titanium through the refractory materials and into the ceramics.

"The current trend to exotic materials," the paper continued, "has and will continue to place a greater burden on the airframe designer.

"In the past he has been accustomed to designing in aluminum, and his experience allows him to design without an extensive amount of coordination with Material and Manufacturing personnel. In essence he has had control of the design by knowing

(See MATERIALS, page 5)

MEETINGS

New License Society Selects Oliver to Speak

Corporate Licensing Administrator John Oliver has been selected keynote speaker for the two-day founding meeting of the Licensing Executives Society at Hollywood Park, Florida, October 21 and 22.

A pioneer in developing product licensing as a significant corporate function in the United States, Mr. Oliver also has been elected temporary West Coast vice president subject to formal approval by membership at the first meeting.

Mr. Oliver

According to Mr. Oliver, the new society will have as its chief objectives:

—To improve the professional status and ethics of licensing directors;

—To exchange general experiences in domestic and foreign licensing;

—To foster a better understanding of the licensing function as an aid to and a part of effective management;

—To keep members informed of changes in law and government regulations which may affect licensing.

Mr. Oliver was instrumental in establishing a Licensing Committee of the Los Angeles Chamber of Commerce and has been its chairman since 1958. The committee has been the principal vehicle for promoting product licensing on the West Coast through such activities as Licensing Opportunity Day and other exhibits which have served as a market place for companies seeking new products.

Mr. Oliver's other efforts in promoting the professional status of licensing has included dozens of speaking engagements before other professional societies and seminars. Last week he addressed the Long Beach chapter of the American Society of Tool and Manufacturing Engineers, and on November 2 will speak to the Santa Ana Valley chapter of the same society.

He will be the co-chairman and keynote speaker December 6-8 at an American Management Association seminar in Los Angeles on industrial utilization of by-products from the aerospace industry.

"Speaking about licensing is an easy and pleasant task," Mr. Oliver said, "because it is stimulating and profitable to all parties involved.

"Licensing is profitable to the inventor of a product through initial cash awards and subsequent royalties; it is profitable to the licensor through long-term royalties with a minimum overhead expense; it is profitable to the licensee through increased sales volume from new products; and it is profitable to the consumer who is the ultimate beneficiary of commercial application of the latest aerospace technology."

EDP Discussion Led By Dan Cashier

Electronic data processing (EDP) as a tool of accounting management and the accountant's responsibilities for successful implementation of EDP systems was discussed October 20 by Dan Cashier, group administrator of General Accounting at Northrop Ventura, at a meeting sponsored by the San Fernando Valley chapter of the National Association of Accountants.

Mr. Cashier is discussion leader of one of two sessions which will run concurrently. The other session will feature Frank A. Sweeney of Defense Contract Audit Agency who will speak on the accountant and government contracting. The meeting will begin at 5 p.m. at the Skytrails Restaurant at Van Nuys Airport.

HOW TO ANALYZE AIRCRAFT FATIGUE

Strip It, X-Ray It, Test Each Component, Reassemble It

Northrop Norair this month passes the mid-point in conducting one of the most comprehensive and detailed teardown inspection programs ever performed on military aircraft.

It is called an Analytical Condition Inspection (ACI) program.

It involves two Northrop-built T-38 Talon trainers, sister ships in a fleet of aircraft that has established an enviable record in more than adequately meeting mission requirements while maintaining one of the lowest jet aircraft accident rates in history.

The program is, however, indicative of current emphasis in the Air Force to plan ahead, to prevent possible problem areas, and to keep a maximum number of aircraft operational.

As part of contractual obligations on the T-38 program, Northrop Norair performed a detailed Fatigue Certification Test program completed in late 1964. It led to conclusions that the T-38 airframe could be operated and maintained at base level for a projected life of 15,000 flying hours without a depot or factory-level inspection.

Despite the thoroughness of the fatigue tests and the obvious success of operational T-38 squadrons, it was recognized laboratory testing could not reproduce in-service environments, particularly with respect to temperatures, pressures and long-term exposure to weather.

Thus, the ACI program becomes a sort of marriage of laboratory testing and service usage to augment existing test data on the aircraft.

The Air Training Command and Air Force Logistics Command, through its San Antonio Air Materiel Area, are responsible for the ACI program with coordinating efforts provided by Northrop's Air Force Plant Representative.

Briefly stated, the ACI objectives are to verify through tear-down inspection, beyond the scope of base capability, that the aircraft condition is consistent with that predicted; through wear measurements and analysis of the performance of functional systems, to establish or verify replacement, maintenance, and overhaul schedules; and to verify or augment Structural Repair Manuals.

Two high-time T-38 aircraft from ATC using squadrons were selected for the program.

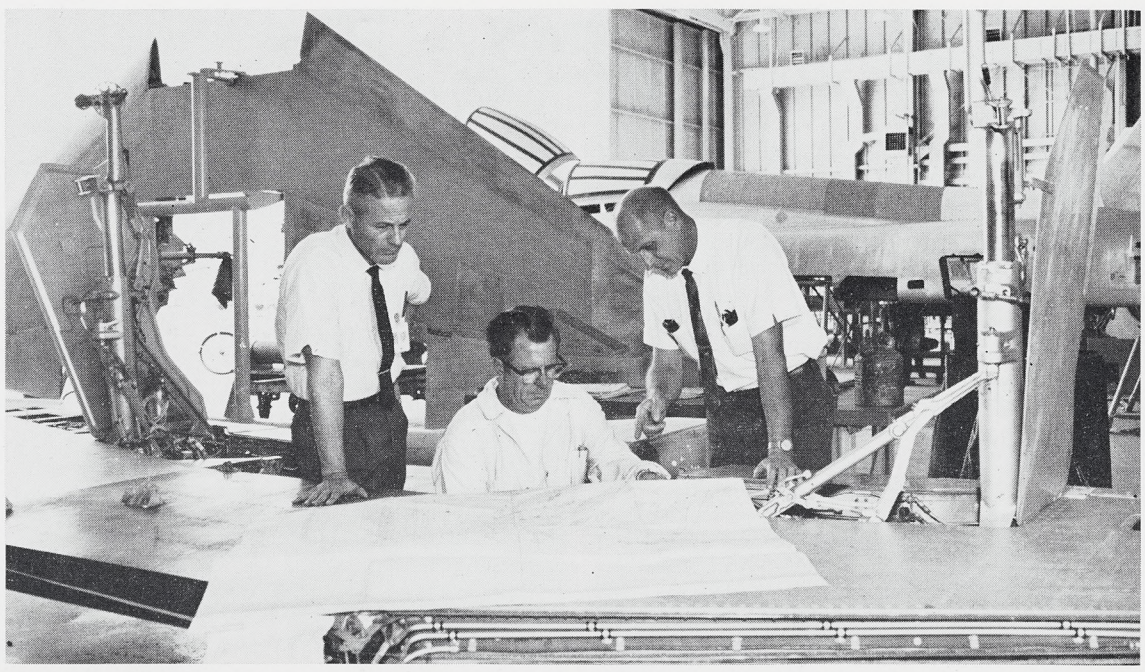
They are involved in a rather unique program which is a reverse of assembly steps taken to produce new T-38s.

First, the aircraft went to Palmdale for functional test flights in which their performance was compared with current production standards and production aircraft.

"We found both T-38s to be in good condition despite the fact each has logged in excess of 1650 flying hours," said V. G. Cardoza, project director, T-38 Project.

Following special systems test carried out at Palmdale, test ships were stripped of all paint and

(See INSPECTION, page 5)



EXACTING ROUTINE—Tom Boesvert (left), project leader, and Gunnar Carlson (right), foreman, confer with John Williams during T-38 tear-down inspection work. They are shown with wing assembly. Two high-time T-38s were subjected to detailed tear-down inspection under Air Force program.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Stole, mink, natural sapphire, seldom worn, $350. Gardena, DA 3-6641. A

Apt, 4-unit, 1-yr.-old, carports, San Pedro, P.V. area, near school, park, & freeway, $45,000. Box 1801. A

Buick station wagon, 1955, 4-dr., p/b, p/s, auto trans., w/s/w, recent o/haul, $325. Long Bch., 596-1280. A

Range, gas, Kenmore, 26x30, 2½-yrs.-old, 4-burner, Visi-Bake oven, $75. Hawthorne, 644-1572. A

Aquarium, complete, 7½-gal. & 10-gal., $25. Hawthorne, 676-1441. A

Buick Electra, 1960, convt., bucket seats, $1175. L.A., PL 7-7911. A

Lawnmower, Craftsman rotary, instructions & parts list incl., $50. Gardena, 329-9484. A

Coffee Table & round lamp table, mahogany, $20. Torrance, FA 8-4243. A

Buick Roadmaster, 1955 4-dr. sedan, p/s, p/b, r/h, auto. trans., orig. owner, avail. after Nov. 1, $350. Glendale, 241-7656. A

Surfboard, 10'3" Bing, $75. Torrance, FA 8-6567. A

Piano, cabinet grand, mahogany, $150. Torrance, FR 8-1350. A

Home, 4-bdrm., fam. room, 2-bath, & built-ins incl. dishwasher, fenced yard, 1-yr.-old, 1 mile to Research Park, $41,900. P.V. Pen., 377-5172. A

Ford, 1958 V-8 4-dr. h/top, r/h, $250. Anaheim, 776-0849. A

Doll collection, miniature, 86 dolls & animals, $15. P.V. Pen., FR 8-1863. A

Cemetery Plots, 2 at Inglewood, Greenlawn sect. adjoining, $350 ea. Hawthorne, OS 6-8842. A

Chevrolet SS, 1963, 409 w/425 hp, 4-spd., new 488 positraction, Douglas headers, American mags, 1900 act. miles, many extras, $1950. L.A., 757-5455. A

Sportsman, 26" Huffy, 3-spd., spring book rack, front & rear gen. lights, high pressure tires, $25. San Pedro, 831-4956. A

Corvette, 1962, h/top, 4-spd., positrac., 300 hp, tonneau, $2200. Gardena, 327-3811. A

Couch w/matching chair, $45. Torrance, 834-2845. A

Home, 3-bdrm., 1¾ bath, recently painted, dble. garage, water softener, block walls, patio, near schools & park, 5 minutes from Norair, $24,800. L.A., PL 6-0015. A

Pup, poodle, 10-wks-old, black male, AKC reg., has shots & papers, $75. Compton, 632-4978. A

Volkswagen 1600, 1966, square back sedan, 65 hp, disc brakes, 1600 miles, $2495. P.V., 377-1075. A

MGA, 1957, recent eng. overhaul, $550. Redondo Bch., 379-6456. A

Buick, 1962 LeSabre, 4-dr. h/top, air cond., $1850. L.A., AX 4-1249. A

Doodle Bug, lots of chrome, $100. Inglewood, PL 6-7681. A

Accordion, 1020-bass, $85. L.A., PL 7-4487. A

Cabin Cruiser, 24', glassed hull, 2 bunks, 50 hp Mercury outbd., self-starting, recently painted, $750. Torrance, PL 6-4974, MA 2-5966. A

Hams, complete station, national NC-300, EICO 723, 60 watts, 8 tals, relay, complete inverted vee antenna w/coax. mast & guys, $210. San Pedro, TE 3-9696. A

Motorbike, Sears Mo-Ped., $95. Hawthorne, OS 9-6247. A

Rifle, Marlin 39-A, level action 22 cal., Weaver 6x scope, diamond inlay, vinyl case, 100 rds. ammo, $85. Hawthorne, 676-4251. A

Corvair Monza, 1963, 4-spd., other extras, $1275. Lomita, 326-8959. A

Surfboard, 9'3", 3 redwood stripes, $50. Torrance, 375-9657. A

Pups, German shepherds, 5-wks-old, $30 males, $25 females. Northridge, 349-5904. A

House, 3-bdrm. & den, redecorated, fenced yard, $18,950. Inglewood, OR 4-0366. A

House, 4-bdrm. & family room, 2½ baths, 1 acre, horses OK, near Northrop Ventura, $35,000. Somis, 805-482-1186. A

Bedroom Set, dresser w/mirror, headboard & frame, 2 night stands, Chinese modern, $20. Hawthorne, 676-0929. A

Ford, 1934, 5-window coupe, 1948 Mercury eng., special carburetor, manifold, & trans., $500. Box 1802. A

Carburetor, Renault, Solex model 28 1BT, completely rebuilt, $9. Torrance, 327-4585. A

Refrigerator, Kelvinator, 12 cu. ft., 6-yrs-old, 80-lb. freezer, $50. Torrance, 371-5916.

T-bird, 1955, classic, auto., all-powered, w/s/w, $1075. Inglewood, 673-0752. A

Sectional, 3-pc., turquoise w/corner table & lamp, $50. Inglewood, OS 6-1475. A

Chevrolet, 1955, Bel Aire, 2-dr., h/top, sedan, V-8, std. trans., $300. Inglewood, 672-5834. A

For Sale

Karmann Ghia, 1958, radio, 4 new tires & paint, $750. L.A., 662-1349, 247-0128. A

Sailboat, 15' Sunray w/trailer, $200. Torrance, DA 3-2144. A

Stereo, AM-FM, radio & phono., walnut finish, $75. Gardena, DA 9-4762. A

Thunderbird, 1960, p/s, p/b, elec. windows, 4-way p/seat, new tires & battery, $1095. P.V., 377-1075. A

Honda 50, only 30 miles, elec. starter, windshield, mirrors, $270. L.A., 754-3946. A

Dodge, 1948, convt., $75. Hawthorne, OR 1-1660. A

Ford pickup, 1964, V-8, auto. trans., r/h, custom cab. $1650. Gardena, OR 7-3884. A

Vacuum Cleaner, Eureka Empress, 2-spd., carrying case, all attachments, 4-mos-old, $80. Culver City, 836-4934. A

Poodle, 1½-yr-old, AKC reg., black, miniature, female, spayed, $50. Tarzana, 343-6669.

Gun Cabinet, solid maple w/glass door, 6 gun racks, storage space, $50. Gardena, 323-0934. A

Honda, 1964 Scrambler, 250 cc, $475. Corona del Mar, 673-5747. A

Pickup truck, 1956, new paint, $525. Torrance, 320-5720. A

Chevrolet Super Sport, 1964, full power, air cond., good tires, $2300. Gardena, 675-0635.

Table Saw, 8" blade, 2 ext. tables & miter, $90. L.A., 670-4557. A

Range, gas, Wedgewood, 27", 3-yrs-old, w/clock, large oven & broiler, $100. Gardena, FA 1-2848. A

Tires, 5-lug 8" rims for boat trailers, $10 ea. Anaheim, 776-1374. A

Crib, full-size, mattress, $25. Hawthorne, 676-3575. A

House, custom-built, 3-bdrm., 1¾ bath, deluxe features, fenced rear garden, close to Northrop, $28,000. Hawthorne, 675-8829. A

Ford town sedan, 1956, V-8, 4-dr., new paint, smog device, $200. Gardena, 323-9143. A

Air Conditioner, GE room-type, used 2 weeks, 7300 BTU, $125. L.A., 388-9798. A

Mercury, 1955, 4-dr., h/top, r/h, p/s, p/b, low mileage, $200. Hawthorne, OS 5-0896. A

Acreage, 40, Xmas Valley, Oregon, sportsman's area, level, $125. acre, Lennox, OR 7-3788. A

TV, 17", Crosley console, mahogany cabinet, continuous tuning, $25. Torrance, FA 8-6839.

Model T Pickup, 1915, new 283 Corvette eng., body needs finishing, $400. Norwalk, 864-0248. A

Bar Stool Set, w/backrest, maple, $10. Long Bch., GA 3-1363. A

Piano, Geo. Birkel ebony baby grand w/bench, $850. Gardena, DA 4-8042. A

Radio/Record Player Stereo, Magnavox, $250. L.A., 645-6815. A

Plymouth, 1956, 2-dr., Belvedere, 6-cyl, auto. trans., r/h, $200. Los Alamitos, GE 0-1952.

Pontiac, 1955, 4-dr. sedan, r/h, good tires, 72,000 act. miles, $250. Redondo Bch., FR 5-5471. A

House, 2-bdrm., 2-bath, new paint, 10% dn., $24,500. Hawthorne, OS 9-7909. A

Bicycle, 26" girl's 3-spd. Schwinn, $20. Lakewood, 867-0593. A

Cabin Site, Lake Arrowhead, has water, electricity, roads & trees, terms avail., $1200. L.A., 476-1635. A

Buick, 1954, Century, $100. Redondo Bch., FR 5-0747. A

Porsche, 1955 convt., new tires $850. Torrance, 371-8365. A

Buick, 1966, LeSabre, 1965, 400 h/top, factory air cond., auto., p/s, p/b, w/s/w, stereo reverb., 6000 mi., $3250. Altadena, 377-6528. A

Piccolo, Bently, wooden, D-flat, completely rebuilt, $110. L.A. 684-8611. A

Home, rustic charmer, 3-bdrm. or 2-bdrm. & convt., completely redecorated, fireplace, covered patio, dble. garage, carport, $23,500. Hawthorne, OS 6-1985, DA 9-5126. A

Toy Poodle, white, 18-mos-old, AKC registered, male, good home wanted, $35. Playa del Rey, 398-1458. A

Gelira 202, 1965, 100 mpg, 20 hp, extras, take over $35 mo. pymts. or $595. Hawthorne 579-5864. A

VW sedan, 1965, 8000 miles, many extras, $1850. L.A., 474-9790. A

Crib & mattress, $15. Hawthorne, 371-0194.

Trailer, 15' Ideal, many extras, $500. Inglewood, OR 1-2058. A

Refrigerator, crosstop freezer, $20. Gardena, 757-2383. A

Guitar, elec. melody, w/med. size Magnatone amplifier, $150. Rolling Hills, 833-9747.

Accordion, Cantino, 120-bass, w/case, $150. Redondo Bch., FR 5-4448. A

House, 3-bdrm., 2 baths, lge. fenced yard & patio, near schools & park, kitchen built-ins, paneled, forced air heat, $23,000. La Mirada, 714-521-1516.

Radio, for 6-volt car or boat, $10. Hawthorne, 676-0418. A

House, 2-bdrm., fireplace, double garage, $21,950. Inglewood, OR 1-3860. A

Mercury colony park wagon, 1963 full power, air cond., 9 passenger, $2495. Gardena, DA 4-5342. A

Ski Boat, 14', 1965 100 hp Mercury motor, trailer, $1500. Hawthorne OS 5-1684. A

Wanted to Buy

Baby furniture in good condition. Anaheim, 530-4869. B

Freezer, 15 cu. ft. capacity or larger, good condition. Torrance, 675-8414. B

Wanted to Buy

Barbell Set. Inglewood, 672-4486. B

Radial Arm Saw or tilt arbor table saw. Torrance, 320-3440. B

Typewriter. L.A., AX 2-4958. B

Steering Wheel, wood, for sports car. Rolling Hills Ests., FR 5-8920. B

FREE (To Be Given Away)

Pups, 6-wks-old, 5 males, 2 females. Torrance, DA 5-1190. D

Rentals Offered

Apt., 2-bdrm., unfurn., gar., w/light duties, $100 mo. Inglewood, 677-5705. E

Apt., deluxe single, furn., large closets, full bath, utilities paid, walk to Northrop, Hawthorne, OS 5-3792. E

House, 2-bdrm., large, fenced yd., trash & water paid, $105. mo. Lawndale, 371-6775. E

House, 2-bdrm., unfurn., water & trash paid, 1 block from Northrop, adults, $85 mo. Hawthorne, OS 6-8283. E

Apt., 2-bdrm., 2-bath, large exec.-type, closed gar., walking distance to Northrop, $125 mo. Hawthorne, 676-9620. E

Apt., 2-bdrm., all extras, closed gar., encl. yard, 10 mins. to Nortronics P.V., $110-$125. Torrance, 375-9397, 375-2091. E

House, 4-bdrm., fam. rm., 5 min. to Harbor Fwy., fenced, walk to jr. high school, corner, 2 fireplaces, 2-bath, lease, $245 mo. San Pedro, TE 3-4591. E

House, 1-bdrm., furn., large encl. yard w/vegetable garden, $80 mo. San Pedro, TE 3-2512. E

Apt., 1-bdrm., closed garage, laundry facilities, water & trash paid, $89. Torrance, 328-6955. E

Apt., 2-bdrm., furn., adults only, no pets, $125 mo. Inglewood, 673-0401. E

Studio Apt., 3-bdrm., 2-bath, unfurn., pvt. patio, closed gar., soundproofed, hot water & trash paid, near schools, $175 mo. Torrance, FR 5-0867. E

House, 2-bdrm., no garage, $90 mo. Gardena, OR 7-3884. E

House, 3-bdrm. & den, refrig. & breakfast bar stools furn., 1½ baths, $180 mo. P.V. Pen., 377-8748. E

Studio Apt., 2-bdrm., completely furn., 1½ baths, pool, sauna bath, putting green, sub. parking, rec. rm., $164.50. Redondo Bch., 674-1566. E

House, 2-bdrm., fenced yard, gar., stove & refrig. avail, close to Northrop, $135 mo. Harbor City, 325-5705. E

House, 3-bdrm., fireplace, air cond., less than a year old, completely landscaped, $170 mo. Lakeview Ter., 899-3019. E

House, unfurn., 3-bdrm., 1¾ baths, fenced yd., water & lawn paid, 8 min. to Norair, closed gar., $130 mo. L.A., PL 4-1964. E

Apt., 2-bdrm., avail Nov. 1, 2 blks. to Norair, $115 mo. Hawthorne, OS 6-7417. E

House, unfurn., 2-bdrm. & rumpus rm., backyard w/b-b-q pit, $125 mo. Gardena DA 7-2339. E

House, furn., 1½-bdrm., w/garage, half block from ocean, $130 mo. Manhattan Bch., 374-5028, 379-8700. E

Apt., 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

Cabins, Lake Gregory & Crestline, sleeps 6, $25. weekends, $60 week. Venice, EX 1-2040. E

Child Care Wanted

Baby sitting at home, prefer children under 2-yrs-old. Lawndale, 679-9221. H

Personals

Secretaries, 2, willing to share 4-bdrm. house. Hermosa Bch., 374-7109. L

Tap Dancing lessons for children. Gardena, 675-1005. L

For Sale or Trade

Chevrolet, 1958, auto. trans., new tires, A.R.C. record player, $600 or trade for Volkswagen. Montebello, 722-7680. M

House, 3-bdrm., split-level, 1½-bath, dble. garage, for rent or $21,000 or trade equity for vacant lot. Redondo Bch., 374-2433. M

Renault Parts, rearend, generator, starter, complete head & misc. parts, $50 or trade for freezer. Torrance, DA 6-5558. M

Volkswagen, 1961, radio, gauge & spare tank, extras, $900 or will consider trade for vacation trailer. Camarillo, 805-482-6125. M

LIKE TREES AND CONCRETE—Combat ready F-5's blend nicely with both colors of foliage and runway in this scene at Williams Air Force Base, Arizona, where training is currently under way for Vietnam mission.

VIETNAM: 'A Little of Each Of Us Will Be Going Along'

(Continued from page 2)

Cracken and Superintendent Al Graber. Men like Wally Johnson, John Vilarino and Ron Wyatt were key leaders. Special crews were "drafted" for the tasks and their normal tasks assumed by regular crews. The task force numbered about 36 men.

I found that at Palmdale a seven-day week was the rule for all supervision and most technicians. Captain Earl Hallum, AFPR Flight Test officer, added to my knowledge with:

"You cannot give these men too much credit. They took a difficult task and performed it under pressure. And they did the job right the first time."

Those who know the program best were high in their praise of a fantastically successful flight test program supporting it. One of the first modified aircraft was sent to Edwards Air Force Base where it joined another F-5 in a round of certification tests. Bob Elder, Hank Chouteau, Dick Thomas, John Januleski and Darrell Cornell were instrumental in all flight test operations. Jack Farley and Les Ferguson were key support leaders at Edwards.

One indication of the extent of this program was the fact that in just three days of extensive tests Northrop and Air Force pilots made nearly 200 hook-ups with the jet tanker in refueling tests.

Larry Green was a key leader in flight test engineering activities supporting the over-all program.

Concurrent with the production efforts Northrop was filling still another role as an agent for the Air Force Logistics Command helping round up and prepare for shipment requiring spares. Product Support's John Jennette informed me this involved more than 800 items over and above normal Air Force logistic supplies.

At the same time the Air Force had ordered an accelerated training program be conducted at Williams AFB for pilots and maintenance personnel of the 4503rd Tactical Fighter Squadron, the unit to operate the F-5s in Vietnam. Colonel Frank Emory, the squadron commander, was a frequent visitor to Palmdale and a driving force in the over-all program.

Special assists were made by men like Captain B. F. O'Brien of the F-5 Systems Program Office and Major Tom Crockett of the San Antonio Air Materiel Area along with Ron Weigle of the same organization.

I wish space were available to list the name of every man and woman who worked on this program. They deserve it. However, I would be remiss in not mentioning men like W. E. Woolwine, the key management leader, and others like Bill Putnam, Jack Nation, Jim Alexander, Bob Miller, Bill Bruschaber, C. L. Fleming and John Martin.

And, of course, there were others like Major Roy Boyd and Jess Dennis of the Northrop AFPR who were always in the thick of the action involved.

Maybe a comment Al Graber made to me sums up the feelings of all who worked on the program: "We have always prided ourselves on producing the best aircraft possible for our customers. We did this and a little more with these F-5s. Most of us like to feel that a little of each of us will be going to Vietnam."

INSPECTION

(Continued from page 4)

markings and trucked to Hawthorne.

The ACI program is centered in Hangar 13 and has involved many organizations and functions at Norair. Every part and system not permanently fastened to the airframe was removed and subjected to nondestructive testing. The remaining airframe hulls were completely stripped of all sealants, etc. and put through similar tests. All electrical wiring and components went through high voltage tests. Wing structures and all honeycomb panels were X-rayed. Exacting wear measurements were made on selected component or system and detailed records made for the publication of comprehensive test results later.

The program got under way in May. Current efforts are involved in re-assembly of the first aircraft now slated for flight test in December. The final ship will be delivered by March 1966.

Each Norair function and activity has contributed to the program on an "as needed" basis. For instance, engineers, inspectors, processing, and tooling people have worked on the program from time to time.

Tom Boesvert was transferred to the T-38 Project office and assigned as project engineer and over-all coordinator for the effort. Gunnar Carlson is foreman of a 10-man Advanced Production crew of technicians assigned to the program.

"When these aircraft are reassembled they will be put through normal production checkout and flight operations," Mr. Cardoza said. "Upon return to using squadrons they will be further exposed to operational conditions and closely analyzed from time to time."

MATERIALS

(Continued from page 4)

the limitations of aluminum alloys.

"This empirical knowledge, gained from experience, does not exist for most of the exotic materials."

Northrop has been involved in several programs related to the optimization and utilization of modern exotic materials. Brazing of molybdenum and Rene 41, hot forming of titanium alloys, machining of titanium and super alloys, titanium welding, and adhesive bonding are among the processes investigated.

Circle R Winners Collect Trophies; Green Tree Next

Playing in C flight, Bill Piggott came within 18 inches of a hole-in-one on the 17th at the Circle R Ranch, Escondido, to capture the Closest-to-Pin trophy of the Northrop Ventura Golf Club.

Bill Pai took the A Flight first place trophy, followed by Lew Vinson. B Flight honors went to George Messenger, first place, and Joe Tyler, second, and Dave Cheney took C flight first place, with Ed Sheridan right behind him.

Pat Gosh captured the women's trophy for the Circle R weekend event.

Northrop Ventura Golf Club will travel to Green Tree Inn, Victorville, California, October 30 for their second golf tournament at the championship course this year. Their initial visit was in March.

The following month, the Ventura golfers will go to the Knollwood Country Club in Granada Hills, teeing off on November 26.

COMBAT

(Continued from page 1)

tion requirements are being met. These tasks were successfully accomplished while maintaining vigilant cost effectiveness control."

Engineering on the project was performed by a special task force under the direction of Lew Nelson, Skoshi Tiger deputy program manager. Fabrication of modified parts was handled by Advanced Production and Weld section at Norair.

Detailed modification work was centered at the Palmdale facility and flight testing was completed by Northrop pilots at both Palmdale and Edwards Air Force Base.

While Northrop was producing the special aircraft, pilots and crews of the 4503rd Tactical Fighter Squadron were already in training for their future combat mission in the F-5's.

Related story on page 2.

IDEAS PAY OFF

Recent check winners in Northrop Ventura Suggestion Award program, shown collecting from Ken Geller (left), are Robert Ruble, John Green, Marvin Shered, Jack Porter, and Bill Cope. Meanwhile, the Holiday Special suggestion drive which concludes November 1 is running ahead of last year's campaign, Mr. Geller said this week.

APOLLO: Task Force Opens Shop At Kennedy Space Center

(Continued from page 1)

Northrop will be responsible for packing pilot, drogue and main parachutes, quality assurance, logistics support, and assisting in installation of the parachute system in the spacecraft.

As Northrop Ventura base administrator, Mr. Buhler is technically and functionally responsible for all Division Apollo ELS operations at the Kennedy Space Center.

The task force organization includes something of a summit meeting for veteran parachute technicians. All have participated in Northrop Ventura's development of Mercury and Gemini landing systems. Taswell Payne, who packed all the manned Project Mercury chutes, will be there, along with Bill Downs, who has participated in development of Apollo packing procedures and has packed numerous Apollo earth landing systems.

Larry Richardson, who has packed all the Gemini chutes, has been at the Kennedy Space Center since the beginning of that program, and will help out on Apollo on a part-time basis between Gemini missions.

Don Severs will be in charge of planning and production control, material control and data control. John Simpson of Quality Control will be responsible for MRB, receiving, in-process and final inspection. Lou Florence, project administrator for the program, has been named to coordinate all activities between Kennedy Space Center and Northrop Ventura headquarters at Newbury Park.

According to Mr. Steyer, a task force will be sent to Kennedy Space Center for each of the first three Apollo test launches. The group that moves to Florida for the fourth launch later in 1966 will remain through the completion of Block I deliveries which extends through 1967.

Special Interest Post Of Explorers Formed

The first special interest post of the Explorer Scouts in Ventura County is being formed under the direction and sponsorship of Northrop Ventura.

George Douglas, Corporate vice president and Division general manager, is chairman of the Explorer Post committee, which is comprised of Ventura department managers. Don Archer of Industrial Relations will serve as Explorer advisor.

Operating guidelines were set forth at a recent meeting between the Northrop committee and David Wuerth, chairman of the Ventura County Council Explorer committee, and Tom Rosser, principal of Thousand Oaks High School. Members of the Post will be drawn from Thousand Oaks High School.

The program provides an opportunity for the interested juniors and seniors in high school to secure firsthand information by experience on possible professional areas of future livelihood. In addition it adds meaning to the secondary school education program. The students learn from actual observation the importance of proper English, the importance of completing their studies in mathematics, and their other courses of instruction.

Among the many things that the program provides for the company is the opportunity to explain and demonstrate the freedom of opportunity and enterprise that has built America into the greatest nation the world has ever known.

Northrop Ventura's program will show the high school students exactly how their business functions. They would go through each major functional organization in the division such as finance, marketing, engineering, production and others. This would be accomplished by taking a project such as the NV-105 target drone presently being developed or the Apollo project recovery system and following the program from inception to completion.

Interested students will be receiving a briefing at the school on the opportunities of the Special Interest Post, and those students selected will receive a special invitation to attend the first meeting October 27 in the Northrop Ventura cafeteria.

Parents of the boys will also be invited to the initial meeting, which will include dinner hosted by Mr. Douglas.

Present plans call for 22 meetings, closely aligned to the school year. Tours to points of interest to the program under study, such as the Naval Missile Center, Point Mugu, are also being considered.

Transtage Fails To Release OV2

Northrop's space environment sensing OV2-1 satellite was launched on a development flight of the second Titan III-C space booster from Kennedy Space Center last Friday.

The OV2-1 was pre-programmed to be released from the nose of the launch vehicle upon completion of the third "burn" of the transtage's engine. (The transtage is the final powered section of the launch vehicle, upon which the OV2-1 rode as a bonus payload).

A malfunction apparently caused the transtage to tumble after the second burn, however, and the third burn was not completed.

The OV2-1, because of operational requirements, cannot operate under its own power until proper separation from the transtage. Thus the satellite is apparently still circling the earth at an altitude of some 400 miles affixed to the Titan transtage.

Time Change Due

Northrop Corporation operations in California will revert to Pacific Standard Time at midnight October 30.

WHERE THERE'S FIRE THERE'S SMOKE

Northrop Ventura's 25-man fire brigade turned out in force this month to commemorate Fire Prevention Week in drill with Newbury Park fire station personnel. Large cloud of black smoke (left) is caused by pouring water on magnesium fire, a demonstration designed to show what happens when you do it the wrong way. Other types of fires extinguished during the drill were routine wood and flammable liquid blazes (story on page 1).

NORTHROP NEWS

NORTHROP VENTURA

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M-C Balloting Concluded for Nine Posts

New officers of the Northrop Ventura Management Club are expected to be announced soon as the week-long balloting for five executive offices and four vacancies on the board of directors was concluded Wednesday.

Bill Young and J. R. (Andy) Andrews are running for the presidential office being vacated by William F. Green.

Candidates for other offices are:

First vice president: Don Archer and Roy Murray;

Second vice president: Dick Tupper and Ron Waters;

Treasurer: Chuck Merlian and Chuck Olmstead;

Secretary: Eileen Munro.

Of the four vacancies among directors, only one post is contested. Gerry Steinhardt and Denny Sherwin oppose each other for the Finance department's seat on the board. Fred Mickey of Technical, Jean Ozga of Marketing, and Ed Illes of Aero Instrument Department, were also nominated as directors.

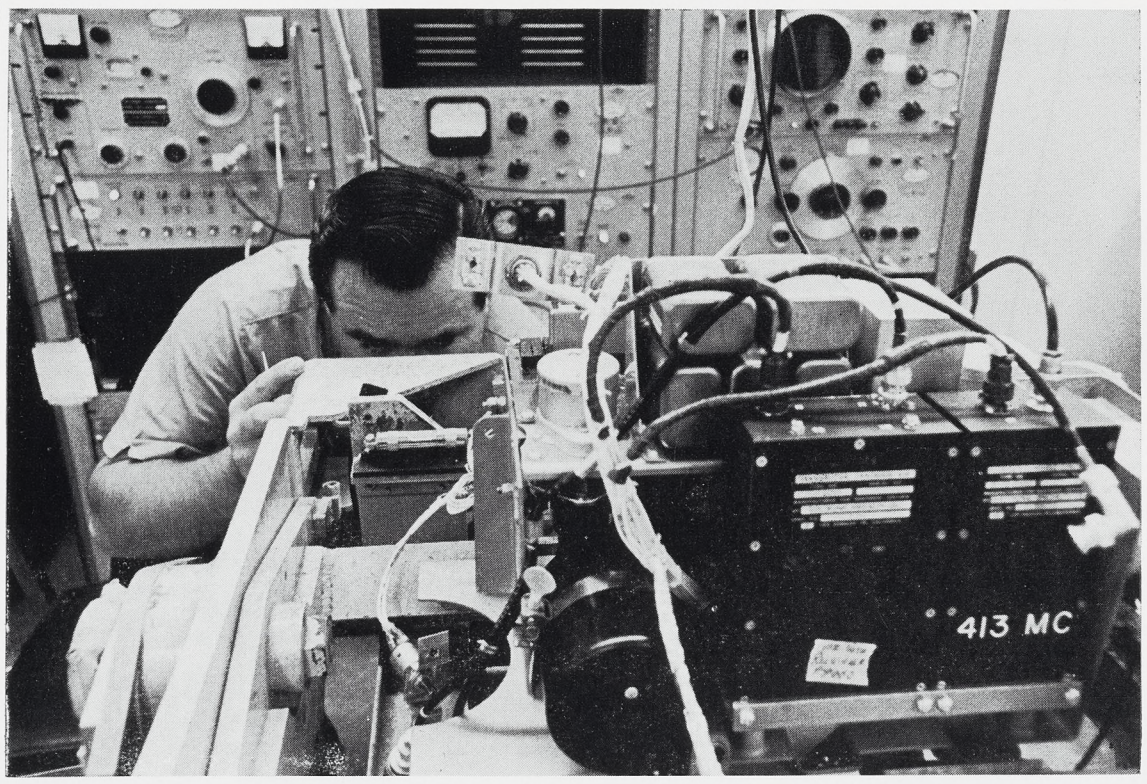
Management Club bylaws call for a representative from each department to serve as directors. Holdover directors, who were elected to two-year terms in 1964 are Bob Iehl of Manufacturing, Fred Weglin of Quality Control and Clyde Corder of Administration.

Another director may be added later from Nortronics Applied Research department under provisions of a bylaw amendment, President Green said. The amendment makes the Club open to any Northrop employee working in the Newbury Park area.

Ralph Friesen served as chairman of the nominating committee this year, assisted by Walt Mann, Rex Fairless, Dorothy Manley and Eleanor Hendry. Cal Peterson served as chairman of the election committee, assisted by Chuck Taylor, Jan Karmire, Peggy Heacock and John Steman.

Election winners will be recognized at the annual Management Club dinner dance December 4 and at the first meeting in 1966.

RP-76 ON THE LINE



The eyes peering over RP-76 drone frame belong to Jim Holmes, who's running checks on electronic equipment and engine before the supersonic target moves on down the production line. Final assembly of drones for Army contract awarded in January began last month and will continue through December. RP-76, with a solid rocket engine, is air launched from wing of F-89's flown by Northrop Ventura. (Photo by Bob Thornton)

1965 Annual Report Rolls Off the Press

Northrop's annual report for fiscal 1965, summarizing a host of noteworthy events and financial details for the period, came off the presses last week.

In his message to the shareholders, President Thomas V. Jones noted that "the diversity of our defense activities and products flows from basic decisions taken some time ago."

The report on the Corporation's accomplishments in the 1965 fiscal year is available on request to employees, who may obtain copies at any Personnel office.

NRC's Holiday Dance Set for December 11

Northrop Corporation's annual NRC Holiday Dance, sponsored jointly by Northrop Recreation Clubs, will be held December 11 this year.

Les Brown and "his band of renown" will provide the music and International Hotel the ballroom. Further information will be available November 17 in NORTHROP NEWS.

Ewing Describes Ringsail Role in Future Systems

Northrop Ventura paradynamicist Ed Ewing last month became the first industry expert to be invited by NASA's Manned Spacecraft Center to participate in one of the agency's Technical symposia.

Mr. Ewing

Mr. Ewing related the evolution of the Ringsail parachute—which he invented in 1954 while developing a personnel parachute for the U.S. Navy Bureau of Aeronautics—through present Gemini and Apollo landing system configurations and up to development work in progress on

(Photo on page 4)

chutes two to three times larger than those now in use.

Advanced development of the basic Ringsail design include the Century—two 127-foot diameter chutes to recover payloads in the 17,000-pound weight range—and the 20K, which may be up to 205 feet in diameter and designed for a 20,000-pound load.

By comparison, the Project Mercury main chute was 63 feet in diameter and the Mercury payload weighed approximately 2300 pounds. The Gemini program uses an 84-foot main chute for an approximate 4400-pound capsule, and Project Apollo uses a cluster of three 83-foot chutes to recover an approximate 10,500-pound payload.

"The Gemini 84-footer is the last of the 'old-fashioned' Mercury type Ringsails," Mr. Ewing said. "The program of experimental innovations sparked by the Apollo cluster was continued in the Century program with Ringsails 123 to 127 feet in diameter.

"The Century will probably find its best use as a reserve parachute in advanced spacecraft landing systems employing other primary surfaces such as a controllable gliding parachute," Mr. Ewing told the assembled scientists and engineers.

"But we could also use one to advantage for soft landing Gemini on Texas sod. So doing would have several benefits, but mainly it would reduce the incidence of seasickness among returning astronauts."

One of the most important segments of Mr. Ewing's paper described the complexities of parachute development.

"No one would suspect that such objects could pose any really serious technical problems," he said, "but ask the average wind tunnel engineer to test a parachute in his drafty facility and more likely than not he would walk away with tears in his eyes."

(See EWING, page 6)

Gliding Chute Development Is Awarded

A contract for development and test of a new controllable gliding parachute designed for pinpoint landing of manned space vehicles has been awarded to Northrop Ventura by the National Aeronautics and Space Administration.

NASA's Manned Spacecraft Center at Houston has announced the contract is part of a program to select a controllable parachute for test application with an Apollo type vehicle.

The basic landing device for the Apollo spacecraft, a cluster of three 83-foot Ringsail parachutes, already is in the advanced development and test stages at Northrop Ventura.

The NASA contract calls for development and flight test of a Cloverleaf parachute approximately 50 feet in diameter for recovery of a one-half scale (5000-pound) vehicle. From data received, NASA then will determine the configuration required for test landings of a full-scale Apollo vehicle.

The Northrop Ventura Cloverleaf design is the result of five years of investigation into controllable gliding parachutes. It consists of a three-lobed parachute in the shape of a cloverleaf.

In descent, the forward lobe is provided with a formed leading edge. Movable cloth panels operate much as aircraft ailerons for turn and as aircraft elevators for variable glide angle.

The Cloverleaf already has been flight tested more than 70 times in sizes ranging from 16 to 40 feet in diameter. The latter is capable of earth-landing a 2000-pound load.

In flight tests, the Cloverleaf has demonstrated ability to glide up to nearly two feet horizontally for each foot of vertical descent. Glide angle and rate of turn may be controlled by the spacecraft pilot, by remote radio signal, or by homing upon a ground radio beacon.

Control is achieved by servo-actuated motors which reel in appropriate suspension lines, or play them out according to the glide and turn rate desired.

Camera Club Sets First Annual Show

The Northrop Ventura Camera Club will have its first annual photographer's show on November 16 at 7:45 p.m. at DAV Hall, 6543 Corbin Avenue, Reseda.

All employees and their families are invited to attend the show. Admission and refreshments will be free of charge.

Earl Muehlenbach, in Engineering Support unit, has recently returned from an European trip. He will conduct the first annual show which will be of color slides he took during his trip while traveling through Germany, Austria, Switzerland, Yugoslavia, Spain, Italy, and France.

He purchased a Volkswagen

(See CAMERA, page 6)

BUCK'S THE SAME MAN

From Bruin Backfield to Production Line

It's a long way from Westwood Village to Newbury Park and a long time from 1937 to 1965. But Buck Gilmore has weathered the interim between his three years as football letterman at UCLA and his present job as foreman of the Mechanical Production shop at Northrop Ventura without too much change.

Mr. Gilmore

True, his favorite game today is golf and his weight is up a little from the 165 pounds he moved around the football field, but outside of some stiffness from old injuries and a few character lines on his face, he's the same man.

Buck played right halfback for UCLA, beginning as a sophomore in 1937. He was co-captain of the team that tied USC for the Pacific Coast Conference championship in 1939. His teammates included such luminaries as Kenny Washington, Woodrow Strode and Jackie Robinson.

Buck missed only three games due to injury during his three years on the team. He figures he was in about half the time UCLA was on the field. Since he was up against some 200 to 250 pounders, that accounts for the bruises that brought some stiffness to both knees and his right wrist.

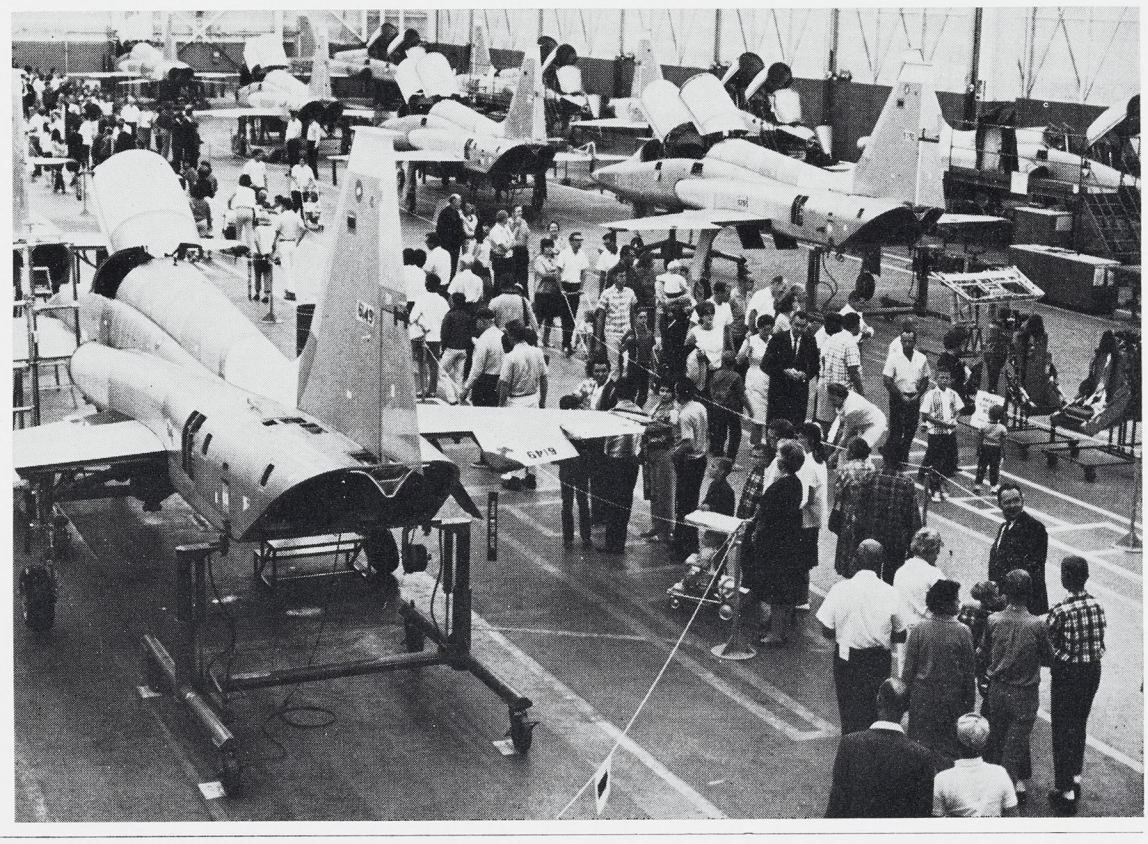
While he was with the Bruins the team worked in motion pictures, including "Life Begins in College" with the Ritz Brothers and "Saturday's Heroes." These have both showed on TV lately and Buck has had a chance to reminisce over his school days while watching them.

Even before he went to UCLA, he was football minded, and at

(See FOOTBALL, page 6)

ANTELOPE VALLEY AVIATION DAY

Northrop Norair's Palmdale facility was host last month to approximately 6,000 men, women and children during a half-day open house for Northrop employees and their families held in conjunction with Antelope Valley Aviation Day. Afternoon activities centered around air show which attracted 60,000 spectators. Topside view of F-5 (above) was offered by outdoor static display at air show. Seats (top right) manufactured at Northrop Ventura were part of display in Northrop assembly area, as were bottom photos of F-5/T-38 final assembly line.



BUT NOT AN ASTRONAUT IN SIGHT

Houston Space Port: A $130 Million Man-Machine System

By MAIDA EWING

EDITOR'S NOTE: As the Gemini and Apollo programs progress, the Manned Spacecraft Center at Houston is becoming the focal point of the U.S. interplanetary exploration project. When Northrop Ventura's Ed Ewing, inventor of the parachute which has returned all astronauts to earth to date, was invited to be the first industry man to address a NASA technical symposium, we asked Mrs. Ewing who accompanied him, if she would share with all Northrop employees her impressions of America's newest edifice to science and technology. Mrs. Ewing is Living Page editor of the Conejo News.

A room where "space" comes down to earth . . .

A field where astronauts practice walking on the moon . . .

A color screen television area where charts are chalked up in different hues to show where America's astronauts are in space . . .

A charting area with a floor full of wires that keeps track of two men in space, their heartbeat, blood pressure, every flick of their eyelid and twitch of their cheek . . .

And a computer system that is linked with TV cameras into the world's most complex system of tracking.

That's what they've built at the National Aeronautics and Space Administration's Manned Spacecraft Center near Houston, Texas.

It is almost too much to believe. But I saw it, and it's all true.

Our tour began with a bird's eye view of NASA's 1628 acres from the top of the Administration building. Only 15 percent of the land is occupied at the present time, with five new buildings in various stages of construction; massive modern structures surrounding three man-made lakes where ducks and swans swim undisturbed.

From the lobby of the auditorium, where the Mercury 7 spacecraft holds a position of honor and colored photographs of earth line the wall, we were taken to the Mission Control Center building for a practice run of a launch of Gemini 6.

Seats in this plush third floor viewing room are occupied by top brass during flight times. Today the Minister of Defense for Nationalist China and his entourage arrived for the practice run.

Major Henry E. Clemens briefed us first by pointing out the Control Center is laid out essentially the same as the controls in the spacecraft.

At consoles, experts in their field man these controls with back-up experts, much like branches on a family tree, in rooms on both sides of the Control Center. On two big wall screens, the spacecraft is following in its flight path.

About here NASA Flight Director Chris Kraft took over and explained that there were seven projectors behind the screens and different colors used to denote various information items, i.e., a blue line for night side operation and a red for daylight. TV channels were constantly routing information, changing the master screens moment by moment.

"This building represents one-half the cost of the entire facility," Mr. Kraft said, adding that more than $130 million was invested in it.

The facility contains a complete weather station cable which provides weather stateside and for any earth weather, but aside from that they are also working to provide space flight weather information.

Mr. Kraft said the five IBM computers we had a peek at later, make up the largest computer complex in the world. Our guide told us this system would soon be replaced by a yet more complex system, at no additional cost to NASA which rents the equipment from IBM.

"The television system is our means of getting all the information before the people that must make the decisions, and we try to make all of them in this room," Mr. Kraft said.

He added that the television-computer system was very complicated . . . "We are just beginning to learn how to use it. It has been an experiment that has made our job a great deal easier."

Pointing out that by automating —taking the human element out of controls, they have to be sure it is right. "We have a wonderful tool, but must have the confidence that the program will give us the proper information and the right answers," Mr. Kraft said.

Next stop was the second floor of the Control building where we

(See HOUSTON, page 3)

ARTIST'S CONCEPTION OF MANNED SPACECRAFT CENTER

BRIG. GEN. RILEY TAKES COMMAND OF NEW AF UNIT

Brigadier General Daniel E. Riley has assumed command of the Air Force Systems Command's newest division—the Air Force Contract Management Division with headquarters in Los Angeles.

This is the parent headquarters of the Air Force Plant Representative office located at Northrop Corporation which is commanded by Lieutenant Colonel Rufus K. Keeling.

The Contract Management Division coordinates and directs the activities of nearly 4000 Air Force personnel stationed at 33 locations across the nation, Colonel Keeling said. They man AFPR offices, like the one at Northrop, located at 22 major aerospace contractor's plants. In addition, there are five test site offices at important test centers and at the Air Force Missile Development Center at Cape Kennedy, Florida and five contract support detachments assigned to missile launch sites where contract work is in progress.

The AFCMD is one of nine divisions under the Air Force Systems Command, General B. A. Schriever, commander.

NSA Chapter Names Reynolds Speaker

Vern Reynolds, supervisor of the Northrop Norair Communication and Supervisory Training branch, will speak at the Twin Harbor chapter, National Secretaries Association, meeting November 16 at the Plush Horse Restaurant, Redondo Beach.

Mr. Reynolds will discuss day-to-day spoken and written communication in a speech titled "Do They Really Understand You."

Reservations for the 6:30 p.m. meeting may be made through Rita Harris, ext. 2436, or Lee Ober, ext. 1395. All reservations must be made by November 12.

Total cost is $3.50 per person, including dinner.

FIGHTER DISCUSSIONS

Lieutenant General James Ferguson (center) Air Force deputy chief of staff for research and development, recently flew a Northrop F-5 in evaluation at Edwards Air Force Base. Pre-flight briefing found him discussing fighter with Major General Irving L. Branch (left) Air Force Flight Test Center commander, and Bob Elder, Norair director of Flight Operations.

HOUSTON: Where Neither Man Nor Machine Can Afford to Err

(Continued from page 2)

were told the total length of the wires under the floor was sufficient to stretch to the North Pole and back.

Also on the second floor was the biomedical laboratory with a TV hookup to the flight surgeons' console upstairs. Through telemetry the myriad of wires attached to the astronauts send signals back to earth and are recorded on wide paper tapes by oscillographs. If anything unusual comes through from the heartbeat, lungs, etc. the operator can tear off the sheet, place it under the television camera in the corner of the lab and it is picked up upstairs at the chief medic's console.

"There is so much medical history on the astronauts," we were told, "that we can tell when an astronaut is going to get sick before he knows it himself."

After a glimpse of the IBM room, roughly the size of a commercial airplane hangar, we visited the huge, high-ceilinged, black painted room where the astronauts practice rendezvous and docking with the Gemini and Agena space vehicles.

There, on frictionless gliders to allow no feeling of motion, with lights in the ceilings simulating sun spots, and nothing but pseudo-space all around, the Gemini guided by astronauts slowly meets the Agena and becomes one vehicle. The space experiment will be to connect the two and use engines, rocket fuel and instruments in the Agena to perform various experimental operations in space.

The rest of the buildings were either in use, being readied for the Gemini 6 flight scheduled October 25, or were out-of-bounds to us earth mortals. The very cool air conditioning everywhere we were told was "for the benefit of the computers, mere humans can shift for themselves."

From the frigid temperatures we were taken into the sunlight to the lunar landing area where a full-scale mockup of the moon landing craft sat boldly against the sky.

A narrow boardwalk led us out into the area over a slag strewn landscape imported in hunks and pieces from Pennsylvania.

There, amid man-made craters, water filled, we were told the astronauts train for moon walking. Cranes are brought out to the area and suited astronauts are attached together with a set of counter balances and weights, to simulate one-sixth gravity such as will be encountered on the moon. Here they become accustomed to "walking," propelling themselves with air guns and learn how to take "samples" of the moon terrain.

This was by far the most exciting part of the tour, science fiction nearly a reality.

The fact that NASA has between 3500 to 4000 employees, with an additional 3000 there under contract from various firms, and another 1000 engineers expected to be added within the year, may account for our not seeing one astronaut. However, we learned Nassau Bay people find them "really wonderful people."

ALL-NORTHROP DAY SCHEDULED AT FAMED UNIVERSAL STUDIOS

Northrop Recreation Clubs have joined forces to book an exclusive all-Northrop day at the famed Universal City Studios November 20.

The gates will open to Northrop ticket holders at 9 a.m. and close again at 6 p.m.

Special group rates will prevail with tickets now available through all Northrop ticket outlets. The savings is $1 per ticket, because of NRC's sponsorship. Rates are $2 for adults and $1.25 for children seven through 11 years. Children under seven, accompanied by an adult, will be admitted free. There are no other charges, except for food, refreshments, etc.

NRC has planned special Northrop Day at Universal Studios where special effects like this will be common. Activities include tour of movie and TV-making facilities, plus other features. Tickets are now available through NRC outlets.

Normally, a tour of all sights at this actual motion picture and TV production center requires about four hours.

Northrop families may ride comfortable "Glamor-Trams" to tour the vast 410-acre lot, viewing sets depicting scenes from around the world, lakes, harbors, etc., property warehouses, sound stages, stars' bungalows and other attractions.

Later, on a studio tour, they may see how motion picture illusions and special effects are created; the "Munster" house; Pavilion of Glamour (makeup); Action Arena; and actually be a part of a man-made snowstorm.

All of Universal Studios' many attractions will be available throughout the day. However, the final "Glamor-Tram" will depart at 3:40 p.m.

Special brochures outlining the many attractions have been printed just for NRC members and may be obtained at ticket outlets.

FRINGE BENEFITS

More About Insurance

by WILLIAM LARRABEE
Vice President—Industrial Relations

In my last article I said that I was going to talk some more about our group insurance program.

If I were to go into each benefit in detail I would need a special edition of the Northrop News. We have our hospital coverage, our surgical coverage, our major medical benefits and our long-term disability policy which I talked about in the last issue. We have our various life insurance programs, special accident benefits, retiree coverage, and business travel policies. Many of these are extended to dependents. All of them make up a fine group insurance package for the benefit of our people and their families.

Insurance coverage is not an easy thing to understand. Insurance companies seem to write their policies in the most complicated language. Nonetheless, each of us should study his certificates carefully because the policy provisions are controlling as to all of us. In the event we are not clear as to the meaning of our policies, we have available to us a Group Insurance booklet included in Working With Northrop. Sometimes, as now, the booklet falls behind because of changes in the plan so we should watch the various announcements which come out from time to time.

When in doubt, we can always ask questions of people like Mrs. Elaine Pillar. Mrs. Pillar came with Northrop in 1952 and has worked in group insurance ever since. She was recently made a supervisor, reporting to Mr. William Waldon. One of the coffee companies has an ad that goes something like, "What Mr. Chase didn't know about coffee, Mr. Sanborn did." In our company, what Bill Waldon doesn't know about group insurance, Elaine Pillar does.

Once we have learned as much as we can about our group insurance we should keep several things in mind. In the first place, I cannot stress too strongly the need for letting our families know what coverage we have. The fact that we have protection gives our wives or husbands and our children a sense of security and they should know what to do in the event we die or are disabled. Secondly, we should always be sure that we use our coverage to the best advantage. One of our people presented a claim quite recently covering his doctor and hospital bills after an operation. He did not realize that under his policy he was eligible for payments on account of post-operative prescription drugs.

Mrs. Pillar

Fortunately, Bill Waldon found out about this as the claim was being prepared and got the man over $300 which he did not realize was covered. The lesson to be drawn from this is that when talking with Bill's people, we should tell them about all of our expenses. If something is not covered, they will tell us, but they can't help us collect for something they know nothing about. In the third place, we should always have in mind the need for keeping track of the beneficiaries we have named under our policies.

We had a recent situation where an employee named his wife as beneficiary, was subsequently divorced, remarried and then died, without changing his beneficiary. The second wife did not appreciate the resulting problem. Fortunately, this does not happen too often, but changes in family relationships, additional children, etc., dictate consideration of possible beneficiary changes.

Finally, each of us should look at our group insurance in the light of his own individual needs and problems. Certainly, some of us need more life insurance than others, particularly where we have children going to school or a mortgage on the house. Perhaps some of us should have our life insurance payable in installments to make sure that a child has continuing funds for his education or where a widow needs income rather than a lump sum. Some of us may wish life insurance for our dependents or may wish to have our dependents covered by our major medical policy.

Those of us who travel for the company should be familiar with the company's accidental death and dismemberment travel policy. Very few of us know that this covers us while traveling on company business, even on such trips as driving between plants. Some of us may find ourselves assigned to or passing through war hazard areas, such as Vietnam, India, Pakistan, Kashmir, or Santo Domingo. In that case, some of our group coverage is invalid and we must get ourselves covered by the special policy which the company carries for such people on company business.

Some of us may wish life insurance or medical coverage after retirement; others may not. The Northrop program has a good deal of flexibility built into it for the individual. We can get the most out of it by taking particular advantage of those provisions which meet our individual needs.

When I have covered more of our basic fringes perhaps I can get back to talking about some of our special coverages and some of the situations which have confronted our people. I am sure that I am going to wish to discuss some further improvements which are coming up shortly. For the present, however, I would like to close this group insurance phase of my discussions by summarizing a conversation which took place at the Corporate office the other day.

We were talking about which of our benefits was of the greatest value to the individual employee. It is hard to argue against life insurance, or accidental death and dismemberment, or travel coverage

(See FRINGE BENEFITS, page 5)

Miller Re-elected Vice President Of National NSIA

Robert R. Miller, Northrop Corporation senior vice president, has been elected to a second term as national vice president of the National Security Industrial Association.

Mr. Miller

Mr. Miller is also past president and a director of the American Ordnance Association, and a director of the Los Angeles chapter, Association of the United States Army.

Joining Northrop in 1951, he served initially as assistant to the vice president for Customer Relations. He was appointed senior vice president in July 1958.

Before coming to Northrop, Mr. Miller had been executive vice president and general manager of Menasco Manufacturing Company and an executive with Republic Aviation.

He is a graduate of University of California at Berkeley.

Kuehnegger Reports On Lunar Studies

Dr. Walter Kuehnegger of Northrop Space Laboratories described a portion of his studies on man's physical capabilities on the moon at the ninth annual meeting of the Human Factors Society at Dayton, Ohio, last month.

The meeting session was devoted to NASA research studies in reduced gravity simulation.

Dr. Kuehnegger's report was based on biomechanical and physiological data from simulated lunar gravity experiments conducted with the lunar gravity simulator at Hawthorne (see photos on this page).

* * *

V/STOL Symposium Hears Norair Paper

John Patierno and Haig Asdurian of the Aero and Propulsion branch, Norair, presented a paper today during the two-day first national V/STOL symposium of the American Helicopter Society at Wright-Patterson Air Force Base.

The technical paper deals with the "Impact of Control Provisions on Mission Performance of Jet VTOL Aircraft Using Reaction Control Systems."

MEETINGS

Northrop Executives in AIAA Meeting; ISA Aerospace Group Hears Ellet Analysis

ALOTS, FLIGHT SIMULATOR ALSO ARE FEATURED

Papers on an Airborne Lightweight Optical Tracking System (ALOTS) and a dynamic flight simulator and a keynote luncheon speech on the future course of the aerospace industry were among major Northrop contributions to the 20th annual conference and exhibit of the Instrument Society of America in Los Angeles last month.

Dr. Ellet

Northrop President and Chairman Thomas V. Jones was a member of the Sponsors committee which planned the conference and exhibit. Dr. Arnold O. Beckman, chairman of the board of Beckman Instruments, Inc., was chairman of the 44-member "blue ribbon" committee.

Dr. Alex Weir, technical advisor to the President, represented Mr. Jones at the awards banquet at which Northrop's contributions to the conference were recognized.

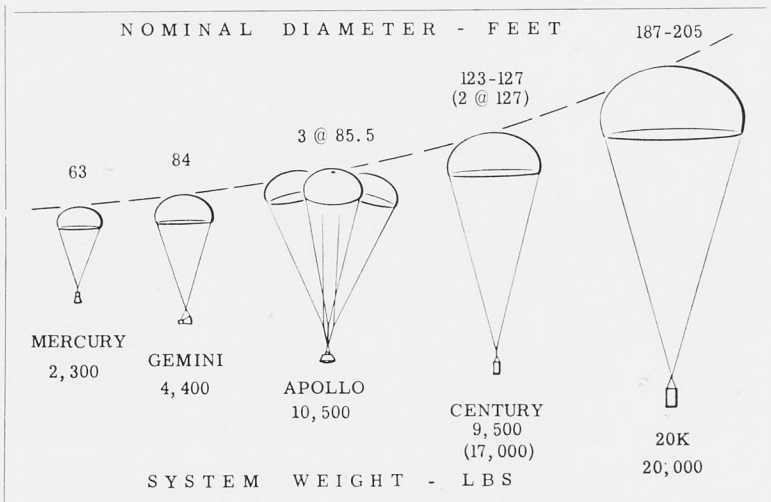
The luncheon address by Dr. William C. Ellet, Corporate director of Market Analysis, was a highlight of the three-day National Aerospace Instrumentation Symposium, held in conjunction with the ISA conference.

Dr. Ellet urged representatives of the aerospace industry to give more consideration to the "totality of public policy" and warned against the effect in the 1970's and 80's of the "tendency to concentrate our attention on individual national objectives without too much regard for the totality of goals."

Dr. Ellet went on to say that no matter who sits in the White House, his first consideration is the nation's security.

"We must of necessity view all other social and technical goals within the context of national security and its resource needs."

In light of the limitations on what the United States can and will do over the next two decades, Dr. Ellet predicted that strategic systems, missile, surveillance and communications systems, ASW research, V/STOL aircraft, and experimental programs will be among major defense expenditures.



EVOLUTION OF RINGSAIL—Northrop Ventura's Ed Ewing described the development stages of the Ringsail parachute, which has been the main landing chute of all manned spaceflights, to a NASA Technical Symposia last month. The Century and 20K chutes in above illustration are advanced developments.

Also active in the aerospace symposium were Norair's Hank Karaszewski, developer of a session of Aerospace Simulation, and Herbert D. Cooles, who presented a paper on Norair's dynamic flight simulator as a general purpose research tool.

"The role of flight simulation in research is not to train the pilot, but rather to use the highly skilled experimental test pilot as the primary measurement instrument in the determination of man-machine compatibility," Mr. Cooles said.

In using the simulator, an engineering test pilot sits in a moving cockpit mockup. He flies the vehicle by sensing the motions of the simulator, watching a moving external visual display and observing variances in the cockpit flight instrumentation, just as he would in normal flight.

The pilot's use of controls during the simulated flight are automatically fed into an analog computer which in turn signals servo drives of the cockpit, external displays and flight instruments to make the appropriate changes in conditions.

The result is a closed loop around the man-machine system.

At the same time the Aerospace Symposium was in progress, a general session on Optical Techniques for Airborne Instrumentation was hearing four papers by Northrop Nortronics specialists.

David E. Conklin, director of Tracking and Display Systems section at Palos Verdes, gave a general description of ALOTS, developed for the Air Force Eastern Test Range.

James F. Lynch and Fred A. Clark of Integrated Systems at Palos Verdes, discussed a recent experiment with ALOTS, the airborne tracking of Echo I satellite. James H. Gisbrecht presented a paper on electro optical sensors for guidance and attitude control, and Applications Engineer Robert L. Rodgers discussed future airborne instrumentation systems.

ALOTS is designed to provide high resolution photographic coverage of missile and spacecraft launch vehicles during launch as well as re-entry. Attached to a C-135 aircraft, the system can provide all-weather tracking by flying above cloud layers which, in the past, have forced postponement of launches.

Northrop also chaired a session on Non-Defense Metrology Requirements.

JONES, HORNER HAVE KEY ROLES IN L. A. SESSION

Northrop Corporation executives will have key roles in the November 15-18 AIAA Aircraft Design and Technology meeting at the International Hotel.

Thomas V. Jones, Northrop president and chairman, will be the principal speaker at the November 16 luncheon session.

Richard E. Horner, Corporate senior vice president and Norair general manager, will be chairman of the opening session on Advanced Precepts of Aircraft Technology. Mr. Horner is national president of the American Institute of Aeronautics and Astronautics, sponsors of the meeting in conjunction with the Royal Aeronautical Society of Great Britain and the Japan Society for Aeronautics and Space Sciences.

Welko Gasich, Norair vice president and assistant general manager — Technical, will deliver a key paper titled "The Northrop F-5, a Unique Concept in the Military Assistance Program" at a Management session to be conducted by Milton Kuska, Norair deputy assistant general manager-Technical.

Darrell L. Hirsch, Norair member of Technical management, will present a paper on "Experimental Investigation of Pilot Behavior in a PIO Situation" at a session on Guidance and Control.

Heading various committees during the meeting will be Northrop's Charles Eyres (administrative chairman), Leo Gay (field trips), Henry Olivier (membership), and Curtis Burdett (international liaison).

Plans call for participants to visit Northrop Norair, one of four selected field trip sites, at 9 a.m., November 17.

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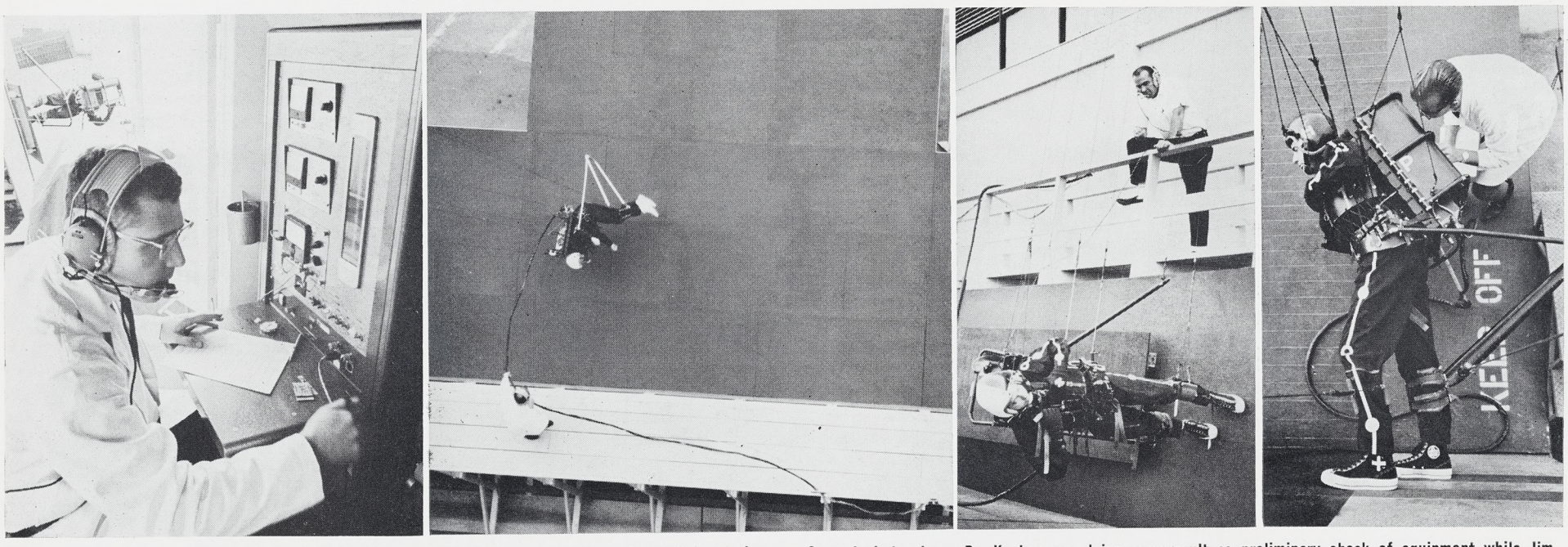
Telephone: CR 4-8061, BR 2-8581.

It's a Half Way Upside Down World for Lunar Gravity Researchers at Northrop Space Labs



Latest moon walk experiments by Dr. Walter Kuehnegger and staff at Northrop Space Laboratories make use of five-story lunar gravity simulator installed at Hawthorne early this year. Hanging from 63-foot cables, subjects walk along treadmill or walkway tilted only 9½ degrees from vertical. Effect is as if he were walking in lunar gravity, one sixth that of earth's. In first photo, Frank Rizzo, biologist, monitors test walk and collects data from sensors attached to human subject (upper left). Second photo shows Dr. Kuehnegger doing somersault as preliminary check of equipment while Jim Schuessler, electronic technician, keeps instrumentation umbilical line clear. In third photo, Mr. Schuessler times walk, while monitoring physiological changes. In last photo, George Fitzgerald, test subject and Cal State at Long Beach student, dons current type simulator harness while Ted Martin, laboratory technician, reads respirometer within backpack.

Classified

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Tempest, 1962, 4-cyl., convt., $950. Fullerton, 871-3805. A

Jeep station wagon, 1959, 4 wd, 1-owner, $1200. Torrance, FR 8-1350. A

Mattress & box springs, twin-size, box springs mounted on wooden legs, $15. Hawthorne, 676-3575. A

TV, 21" Packard Bell, table model, mahogany wood cabinet, $25. L.A., PL 6-0015. A

House Trailer, 17', sleeps 4, elect. & butane icebox, stove, 12 & 110 volt lights, $1350. Gardena, OR 7-3884. A

Pennies, 1 bag, 100 rolls, circulated common date "s" mint, $75. Torrance, DA 6-5558. A

Casement Windows, 2, 3' x 4', screens incl., $10. Torrance, 320-3440. A

Chevrolet, 1958, auto. trans., new tires, A.R.C. record player, $600. Montebello, 722-7680. A

Pickup, ½ ton Chevrolet, 1964, r/h & camper, $1550. Torrance, FA 8-5565. A

Boat, 14' glassed, Mark 20 motor, trailer, spare tires & tubes, life jackets, $200. San Pedro, TE 1-3483. A

Chevrolet, 1958, Del Rey, floor stick shift, $350. Redondo Bch., 374-2433. A

Ski Boat, 14', 1965 100 hp Mercury motor, trailer, $1500. Hawthorne, OS 5-1684. A

TV, Packard Bell, black/white, 21" screen, walnut cabinet, $125. L.A., 645-6815. A

Bedroom Set, French provincial, dresser, chest of drwrs., mattress & spring, $350. Gardena, DA 4-8042. A

Chevrolet, 1953, convt., stick shift, tonneau cover, $250. Torrance, 327-4585. A

Trailer, 21', modern, located in a 4A trailer park on east fork, San Gabriel River, 40 miles from L.A., $1200. Torrance, 325-8211.

Chair Set, 2, aquamarine, on Shephard casters, loose pillows, $100. Inglewood, OR 4-7743. A

House, 2-bdrm., attached comb. gar. & game room, built-ins, 15'x30' pool, 5 min. to Norair, $22,950. Gardena, DA 9-4447. A

TV, RCA 21", $40. Inglewood, 674-2097. A

Chevelle, 1965, Malibu super sport, 327 cu. in., 350 hp, 4-spd., 7500 miles, $2600. Hawthorne, OS 6-9736. A

Ford, 1956, V-8 sedan, r/h, p/s, auto., near new tires, brakes, etc., $295. Buena Pk., TA 8-2857. A

Volkswagen, 1964, model 117, sunroof, radio, seat belts, many extras, $1495. Manhattan Bch., FR 6-1395. A

Bicycle, ladies' 28" wheels, $8-$10. Buena Pk., LA 1-4711. A

Go-Kart, $50. Inglewood, PL 6-7681. A

Corvette, 1964, AM-FM radio, 2 tops, positrac., 4-spd., 300 hp, $3100. Anaheim, 776-4969. A

Range, O'Keefe & Merritt, gas, griddle, auto. clock, controlled oven, $40. Hermosa Bch., 374-5721. A

Pickup, 1958 Ford ½-ton, Fordomatic, r/h, w/s/w, new paint, $545. Torrance, 377-3636.

Hi-Fi console, radio-phonograph, $60. Hawthorne, 676-0418. A

Ice Skates & Shoes, ladies size 7, $20. Hawthorne, 675-1057. A

Boat, 12', Fibreglass, 7½ hp motor & access., mounted on trailer w/lights, $250. Hawthorne, OS 5-3866. A

Morgan, 1960 super sport, all alum. body, tonneau & top. British radio, heater, many extras, recent tuneup, $1495. Santa Ana, LI 4-6135. A

Corvette, Sting Ray, 1963, soft & h/top, r/h, 4-spd., 4:11 posi., p/w, Jardine headers, many extras, $3400 or $3250 w/out soft top. La Habra, 691-9534. A

Trailer, custom-made, 6'x5', hvy. duty car frame hitch, $60. Fullerton, LA 6-1569. A

Rug, genuine Lillihan Oriental, 9x12, $100. Portuguese Bend, FR 7-5370. A

Corvette FB, 1963, 4-spd. trans., 340 hp, r/h, $3100. Gardena, 329-3469. A

Piano, Starr console w/bench, mahogany, $400. Torrance, 323-1698. A

Couch, 8', modern, brown & gold stripe, w/club chair & ottoman, aqua, $110. L.A., 876-8712. A

Trailer, Sierra Camp, 11', foam bunks, 12-V elec. lights, other extras, $300. Placentia, 714-528-3963. A

Snow Tires, 7:10x15, 2, near new, $20. Anaheim, 776-1374. A

Chevrolet Impala SS, 1963, stick, 8-cyl., $1595. Torrance, FR 8-7642. A

Chevrolet, 1950, 4-dr. sedan, heater, nearly new tires, $135. Torrance, 326-4379. A

Washer-Dryer, Westinghouse twin space savers, 25"x25", 26" tall, $100. Torrance, 325-9322. A

Plymouth, 1950, 2-dr., 1947 body, $60. Inglewood, OR 8-1633. A

Ford Fairlane 500, 1958, h/top, V-8, auto., r/h, needs work, $295. Inglewood, 673-1589.

For Sale

Pickup, 1957 ¾-ton Ford, $495. Manhattan Bch., 379-2649. A

House, 2-bdrm., modern, R-3 lot, near Inglewood shop. center, $25,900. L.A., AX 2-9489. A

Cabin Cruiser, 20' Mitchell, 90 hp Johnson, trailer, radio, bait tank, low dn., $2400. Santa Monica, GL 4-7770. A

Accordion, 120-bass, Castle, $100. Torrance, DA 4-0649. A

Chevrolet Impala, 1959 4-dr h/top, auto., p/s, p/b, w/s/w, r/h, 38,000 act. miles, $875. Anaheim, 535-2663. A

Trail Cycle, 1965 Yamaha, street & trail gears, $300. Inglewood, 677-8456. A

Chevrolet, 1955, chrome wheels, custom steering wheel, $300. Torrance, 326-5517. A

Bicycle, boy's, 24" Schwinn Tornado, $18. Hawthorne, OS 6-7766. A

House, near Disneyland, 4-bdrm., fam. rm., fireplace, lge. lot, $1000 below FHA, $27,900. Anaheim, 776-6291. A

Volkswagen, 1965, 11,000 miles, w/s/w, radio, $1700. Fullerton, 526-4168. A

Band Saw w/motor, Delta Milwaukee, 14", $65. Arcadia, 446-1887. A

Ford station wagon, 1958, rebuilt motor, 4 new tires, $600. L.A., 775-7827. A

Dryer, Whirlpool, gas, $40. Torrance, FA 8-7989. A

Powerglide Transmission, rebuilt, 1957 Chevrolet V-8, complete, $40. Canoga Pk., 213-348-6037. A

Bicycle, 20" girl's, $15. Downey, TO 1-6404.

Horse Trailer, single, $300. Torrance, 320-2389. A

Wet Suit, full-length, hood, fits men's size small, w/18 lb. weight belt, flipper slippers, & Cressi fins, $50. Lynwood, 632-2642. A

Ford, 1959, h/top, 401 cu. in., 4-spd. stick, Hydro., r/h, chrome wheels, Tri-Power carb., $975. Lynwood, 631-7745. A

Stereo, Shure, studio dynetic arm & N220 cartridge, $65. Hermosa Bch., 377-6966. A

Washer, Kenmore, 1960, lint filter, 2-spd., 14-gal., $40. Huntington Bch., 714-897-8201.

Austin Healey Sprite, 1962, convt., new brakes, tonneau cover, $1050. Buena Pk., 714-522-4313. A

VW sedan, 1965, 8000 miles, many extras, $1850. L.A., 474-9790. A

Chevrolet Impala, 1961, convt., p/s, p/b, r/h, good tires, $1300. Garden Grove, 894-1035. A

Lot, 67'x145', view, level corner, $19,500. Inglewood, 454-2212. A

Hillman, 1958, 4-dr., low mil., $450. Hawthorne, OS 5-3080. A

Pickup camper, 1959 Ford & 10' sportking camper, $1500. Los Alamitos, 596-4215. A

Mercury, 1959, Montclair cruiser, r/h, new tires & brakes, auto. trans., $550. Hawthorne, OS 5-1607 before 2 p.m. A

Surfboard, Bragg, 8'11" 22 lb. wt., 3½ thick, redwood strip, $65. Hermosa Bch., 372-6755. A

Bicycle, 3-spd. English, 28", boy's, $15. L.A., PL 4-0078. A

Thunderbird, 1959, $650. Inglewood, 675-5031. A

Wig, natural ash blond, 100% human hair, hand tied, adjustable, includes patent wig case, stand & spray, $130. Inglewood, OS 5-8390. A

Cabin Cruiser, 17' Wizard, fiberglass, on trailer, 40 hp elec. start Evinrude, 5 hp aux., fully equipped. $1200. Monterey Pk., 282-0360. A

Speaker & enclosure, 12" Utah coax in 15" unfinished Carlson encl., $15. Anaheim, KE 5-6990. A

Honda, 150 cc, 1964, windshield, $325. Anaheim, 774-4117. A

Surfboard, Paul Hunt, $70. Anaheim, 528-2783. A

MGA coupe, 1959, r/h, $800. La Mirada, 943-6317. A

TV, 21" Westinghouse, new picture tube, $50. Lawndale, 371-0194. A

Volkswagen, 1963, radio, $1225. Hermosa Bch., 372-5985. A

Refrigerator, gas, Servel w/crosstop freezer, $20. Torrance, 325-3724. A

Infant Seat, $3. Rolling Hills, FR 5-8536. A

Train Set, Tyco H-O, never used, $30. Inglewood, OR 2-2370. A

Bicycle, full-size, boy's Schwinn, 3-spd., hand brakes, $10. Long Bch., 596-1280. A

Hutch, Early American John Alden, 42", $90. Hawthorne, OS 6-5921. A

Cookbooks, 3, $5. P.V. Pen., FR 8-1863. A

Cabin, 1-bdrm., 504 sq. ft., on 25' x 100' lot in Sugar Loft, Big Bear, $1500 dn., $1500 side note at $25 mo. & assume $4700 loan, approx. $63.87 mo., $8500. Torrance, 326-4075. A

Motorcycle, 1964 Triumph TR-6, $850. Inglewood, 674-1847. A

Dot, 1964, good dirt bike, $550. Lomita, DA 5-3494. A

Lot, ⅓-acre, near Colorado River in Arizona, electricity, water in, near boat landing, $1995. Burbank, 845-3363. A

Organ, Thomas, electronic, single keyboard, $175. Fullerton, LA 6-2071. A

House, 3-bdrm. & family rm., 1¾ baths, 1650 sq. ft., near Norair, $29,500. Gardena, DA 4-5342. A

Honda, CB 160, 1965, 1600 miles, $495. Manhattan Bch., FR 2-3458. A

Motorcycle, 1963, Yamaha, 80 cc, $200. Torrance, DA 4-8618. A

Chevrolet transmission, 1958-1963, 3-spd. w/Hurst linkage, $50. Hawthorne, 644-3501.

For Sale

House, near Northrop Ventura, 3-bdrms., 2-bath, custom, 2-yrs.-old, $21,900. Redondo Bch., 370-7130. A

Vespa, 1965, 16.2 hp, Grand Sport, 2000 miles, locked glove space, shield, $300. Lawndale, 676-5425. A

House, 3-bdrm., family rm., 1¾ baths, fireplace, h/wood floor, auto. open gar., sprinklers, 5-yrs.-old, $27,500. Gardena, DA 3-4693. A

Corvair Spyder, 1964, 20,500 miles, 4-spd. radio, $1595. L.A., PL 9-5991. A

Pups, doberman pinscher, 6-wks-old, 2 males, 2 females, AKC, $75 & up. Torrance, 320-5063. A

Sewing Machine, portable, Montgomery Ward, w/attachments, $25. Long Bch., GA 3-1363.

Pool Table, 8' balls, rack, cues, $45. L.A., PL 9-7954. A

Washer, auto., Kenmore, 2-spd., 10 cycles, $65. Torrance, 371-6328. A

Organ, walnut, Silvertone, 3½ octave, 1-octave bass pedals, 15" speaker system, $125. Hawthorne, 676-1971. A

Figure Skates, boy's size 4, Reidell boot, winter club blade, worn 3 times, $20. Norco, 735-1232. A

Buick, 1954, good mechanical condition, nearly new battery, less than 50,000 miles, $125. L.A., 476-1635. A

Kitchen Table Set, Formica, 6 chairs, beige w/gold, 72" x 36" full length, $55. Torrance, DA 4-0161. A

Paper Cutter, Michael-Lith, precision lever type ream cutter, $65. Granada Hills, 785-1771. A

Sofa, beige, w/matching living room chair, $50. Torrance, 323-6795. A

Range, elec., $75. L.A., 645-8288. A

Dresser, blonde 6-drwr., lge. mirror, $20. Hermosa Bch., FR 2-8019. A

Crib, mattress & guard rail ext., $18. Inglewood, 674-6395. A

Ford country sedan, 1957, V-8 station wagon, $250. Hawthorne, 644-1785. A

Ford Galaxie, 1961, 4-dr. sedan, T-Bird eng., p/s, p/b, auto. trans., new tires, 63,000 miles, $950. Rolling Hills, 831-9707. A

Wanted to Buy

Dog, must be ½ chihuahua & ½ Boston terrier, will pay up to $10. Gardena, 329-9484. B

Ford, stick trans., & Ford 292 eng. Inglewood, 755-1071. B

For Trade

Laundry Tray, double, for single. Hawthorne, OS 9-6982. C

Rentals Offered

Apt., 2-bdrm., unfurn., laundry, closed garage, walk to Northrop, $110 mo. Hawthorne, OS 5-3792. E

Apt., 2-bdrm., unfurn., fireplace, adults, no pets, $135 mo. Inglewood, 673-0401. A

Studio Apt., unfurn., 3-bdrm., pvt. patio, soundproofed, closed gar., near bus & schools, $175 mo. Torrance, FR 5-0867. A

Apt., walking distance of Northrop, 2-bdrm., 2-bath, large exec.-type, closed gar., $120. Hawthorne, 676-9620. E

House, 3-bdrm., 1-bath, fireplace, gar., yard, near schools, no pets, $175 mo. Redondo Bch., 375-3266. E

Apt., 2-bdrm., 10 min. to Norair, $100 mo. Redondo Bch., 370-9541. E

Apt., 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

Apt., 2-bdrm., $115 mo. Hawthorne, OS 6-7417. E

Cabins, Lake Gregory & Crestline, sleeps 6, $25. weekends, $60 week. Venice, EX 1-2040.

Apt., furn., 1-bdrm., ground floor, rear, $85 mo. L.A. 295-5997. E

Apt., unfurn., 2-bdrm., 2 baths, laundry facilities, open garage w/storage space, children OK, hot water pd., close to Northrop, $125 mo. Inglewood, 672-5798. E

House, lease, 4-bdrm, fam. rm., 5 min. to Fwy, fenced, walk to schools, corner, $245 mo. San Pedro, 377-8856. E

House, 2-bdrm., 2-bath, semi-unfurn., $135 mo. Hawthorne, OS 9-7909. E

Rentals Wanted

House, 2-bdrm., on own lot w/garage, lge. yard, Inglewood, Hawthorne area, will pay up to $110 mo. Box 1901. F

House or Apt., 1 or 2-bdrm., Westminster or Seal Beach area, $80 max. Brea, 714-529-1436. F

Lost

Field Glasses lost Sun., Oct. 17 at Palmdale facility open house. Box 1902 or call Palmdale Tie Line, ext. 56. J

Personals

I would like to thank all the men in Dept. 5843, Nortronics, for their thoughtfulness at a time when it was deeply appreciated. MRS. LUCILLE JOHNSON. L

Share 3-bdrm., 1¾ bath home, w/lge. fenced yard, in quiet residential area with single woman or woman w/1 child, 2 miles from Norair. Gardena, 323-3245. L

Engineer wanted to share 1-bdrm apt., attending graduate school part-time. $50 mo. & ½ utilities. Hawthorne, 644-2592. L

For Sale or Trade

Duplex, near new, 2-bdrm. ea., built-ins, beam ceilings, disposals, $33,950 or trade for house or building lot. Hermosa Bch., 376-3857. M

Forklift Truck Training Reduces Accident Rate

Over the past three years operators of 51 forklift trucks utilized at Northrop Norair have chalked up a remarkable accident-free record.

This accomplishment is an obvious reflection upon the skills of the individual drivers involved as well as an unusual in-plant Industrial Training program which helped to develop them.

Prior to the installation of this program, Norair experienced an average of three forklift truck accidents per year, resulting in some personal injuries as well as costly damage to machine tools, equipment and general cargo.

Norair's Industrial Training branch with the assistance of the Safety and Fire Prevention branch formulated the program and has administered it. Some 150 operators have successfully completed the course and its final examination, earning Norair operator's licenses. Operators are re-licensed and updated annually.

Each participant spends a minimum of six hours in formal training. The course includes familiarization with safety rules and operating procedures. A significant part of the training consists of actual experience in operating forklift trucks in a closed course. The latter ranges from negotiating narrow aisles, tight corners, etc. through material handling, and other types of pre-operational checkout, including inspection of the equipment (i.e. brakes, fuel supply, etc.)

Paul Shuman of Maintenance has been qualified as an instructor and conducts the training for the Industrial Training organization on a loan basis.

Northrop Norair's 51 forklifts range in size from 2000 to 14,000 pound capacities. Each averages four hours operation daily over about 12 miles. The entire fleet logs something like 500 miles daily, 2500 miles weekly and 125,000 miles annually. They move an average of 50 tons of cargo daily or about 12,500 tons each year. Each load may range from a few pounds up to seven tons.

Roy Dietz Is Not Only One to Profit

There is quite a bit of "profit" being realized from Roy Dietz's ingenuity at Northrop Norair.

Mr. Dietz's share is $682 for an approved Suggestion Award. Employees in the Chem-Mill section have fewer tasks to perform. Norair is saving 2769 hours annually. Northrop's customers will get more airplane for fewer dollars.

A Manufacturing Control representative assigned to the Chem-Mill operation, Mr. Dietz noted many small parts (doors, panels, etc.) were being trimmed, masked, then the edges taped, then put through chem-mill processing.

He suggested chem-milling first with a number of individual parts on a single sheet of material. As many as 30 parts could be laid out on a single sheet. Next comes masking, scribing and etching before individual parts are trimmed to size. Eliminated was the taping of edges and individual masking, plus a drastic reduction in handling, layout, etch and basket loading time.

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7 a.m. — 3:45 p.m.

Prospect & 17th St., Santa Ana. North Tustin or east Santa Ana. Earl Eason, NSL, ext. 2655, 544-3639. 2

7:30 a.m.—4:15 p.m.

Van Ness Ave. & Redondo Beach Blvd., Gardena. Sandra J. Thornhill, Norair, ext. 2401, 324-7366. 3

Bloomfield & Imperial, Norwalk. Need ride for two. M. J. Swickard, Norair, ext. 2586. 3

Crescent & Dale, Buena Park. D. H. Eaglin, NSL, ext. 2655, TA 8-2857. 3

8 a.m. — 4:45 p.m.

Manchester & Airport Blvd., Los Angeles. D. J. Hall, Norair, ext. 1551, 645-6815. 5

Ball Rd. & Los Angeles St., Anaheim. Diane See, Nortronics, ext. 775, 772-3267. 5

Atlanta & Beach, Huntington Beach. M. H. Sabet, NSL, ext. 2807, 714-536-1621. 5

Simi or adjacent Valley area, Simi. Beverly Barnes, Norair, ext. 2603. 5

Kornblum & Rosecrans, Hawthorne. Catherine L. Duenas, Norair, ext. 2123, 679-6285. 5

Hollywood Fwy. & Silver Lake Blvd., Los Angeles. Jim Low or F. Almanza, Norair, ext. 1676, 2001, 664-6564. 5

Fairview & La Brea or Fairview & Eucalyptus, Inglewood. Louise T. McCulloch, Norair, ext. 2042, 672-2434. 5

Rides Offered

7 a.m. — 3:45 p.m.

Prospect & 17th St., Santa Ana. North Tustin or east Santa Ana. Earl Eason, NSL ext. 2655, 544-3639. 12

7:30 a.m. — 4:15 p.m.

Crescent & Dale, Buena Park. D. H. Eaglin, NSL, ext. 2655, TA 8-2857. 13

8 a.m. — 4:45 p.m.

Atlanta & Beach, Huntington Beach. M. H. Sabet, NSL, ext. 2807, 714-536-1621. 15

Hollywood Fwy. & Silver Lake Blvd., Los Angeles. Jim Low or F. Almanza, Norair, ext. 1676, 2001, 664-6564. 15

FRINGE BENEFITS

(Continued from page 3)

or, for that matter, any special benefit. Each is invaluable when it is needed. I felt, however, that we should never overlook our major medical coverage. Perhaps I was influenced by the fact that I had just been over a current case with Bill Waldon.

One of our young men, 23 years of age, who had been with us about a year was driving from the Middle West after a visit to his mother and disabled father. En route he was very badly hurt in an automobile accident. For the past year Bill Waldon has been in constant contact with the mother and has paid out approximately $8000 in medical coverage. We all hope that, thanks to the medical care and therapy which this young man is receiving, he will be completely recovered soon. Certainly, without it his chances would have been seriously impaired.

His mother writes, "I am so grateful for all the insurance has done for him. He has come a long way but he still has a long way to go yet . . . I want to thank you, Mr. Waldon, and Northrop Corporation for all your kindness." It is in these catastrophy cases that we really learn how fortunate we are that we have our group insurance to help us in real need.

In the next article—our Retirement Plans and some contemplated changes.

Turkey Shoot Set Saturday By Gun Club

Northrop Venturans familiar with guns and hunting have been invited to join the Rod and Gun Club, 10 a.m., November 6, for a turkey shoot at Aqua Sierra Gun Club. Five birds will be given as first prizes in four events. Second prizes will also be awarded.

The first event will consist of mixed squadding for men's and women's 16-yard trap shoots, with a turkey each going to the best man and woman shooter.

Advanced handicap trap shooting and a skeet-trap shoot follow. A "lucky shot" match with X-marked paper plates as targets at 35 yards finishes up the day.

Many bird and small game hunters are relatively unfamiliar with the enjoyment of skeet and trap shooting, according to Jack Bean, Rod and Gun Club gun captain, who indicated that newcomers to this aspect of the sport would be assisted by members of the Club.

"The people who go after live game," he said, "might be surprised at how much they can enjoy the variety and fun of this type of shotgun shooting.

"They'll also get a chance to improve their technique under controlled conditions."

Jack gave as an example the system used in trap shooting.

"The birds are fired at just about any angle relative to the ground and the marksman," he said, "and the shooter gets to change his position too."

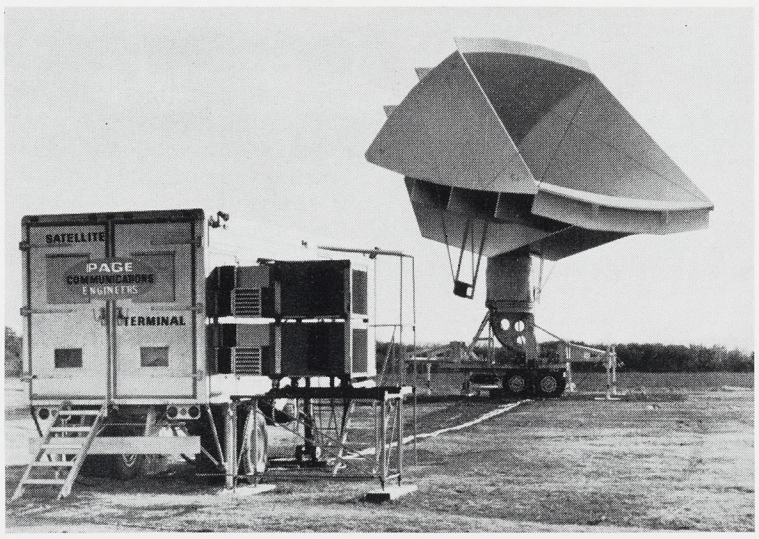
In skeet shooting another method is in effect. One bird is fired at a low angle and one at a high angle for each position the shooter takes.

According to Jack, this means that people in the turkey shoot not only get a chance to win birds for their table, but get to shoot under conditions that show them where they excel and where they need to practice.

There is a $1 entry fee and a charge of $1.50 to shoot in each of the first three events. Loan and club guns are available, as are 12 gauge shells at $2.25 a box.

The Aqua Sierra Gun Club range is at the extreme west end of Devonshire Street in Chatsworth. Additional information may be obtained from Jack Bean at extension 1092, or Earl Muehlenbach, extension 266.

COMMUNICATIONS



This is low cost mobile ground terminal currently being tested by Page Communications Engineers, Washington, D.C.-based subsidiary of Northrop. Development program was stimulated by prospects of expanded worldwide satellite communications and holds considerable promise for use in nations with limited electronic capability.

EWING: Backup System Role Seen for Advanced Ringsails

(Continued from page 1)

Selecting only four of the design parameters of a simple circular parachute requires about 200 different wind tunnel models and 80 drop test models (there are no wind tunnels big enough for the larger models).

If only two test parameters are varied, 7700 test measurements with the 280 models are required. And this no more than adequately describes the parachute's behavior in steady descent, he added.

When we consider the three or four additional design parameters of the Ringslot canopy design the number of different significant combinations could be adequately embodied in no less than 72,000 different models and approximately 1,800,000 steady-state test measurements and 20 million tests of deployment and opening characteristics would be needed.

300,000 Koreans See F-5 Display

The Northrop F-5 was a featured attraction at the Republic of Korea Armed Forces Day ceremonies last month.

It was the first public showing of the fighter and 300,000 spectators turned out to see it. (Delivery ceremonies last May were restricted to civilian and military officials.)

Included in the two days of activity were static displays, fly-bys and a fire power demonstration.

Representatives of allied southeast Asian nations, the United Nations Command and the U.S. Government attended. John Alison, Corporate vice president-Customer Relations, represented Northrop.

CAMERA

(Continued from page 1)

camper when he arrived in Europe and drove 6000 miles on his trip. Photography has been a hobby of his for 20 years. He has become very proficient in photography and has demonstrated his skills at many of the Camera Club meetings.

This will be a good opportunity to enjoy an European trip while still being at home, according to Commissioner Dan Cashier.

The Camera Club membership is open for new members. All Club meetings are held at the Clubhouse on the first Monday of each month at 6:30 p.m.

In order to get new members started in photography, the Club's portable darkroom equipment is loaned to its members for use in their homes. A part of the Club's program is to teach new members photography techniques such as how to make prints, how to develop film, how to make enlargements, improvement in composition, and how to touch up prints, Mr. Cashier said.

At the end of the show, the Commissioner will conduct an open discussion for attendees to answer questions on "How to Improve Your Photography."

FOOTBALL

(Continued from page 1)

Miramonte Junior College in Atascadero, California, he played halfback on the team that beat the UCLA freshmen and ended with a 7 and 1 season, losing only to Cal Poly 14-13.

Buck attended Van Nuys High, where he ran the 100-yard dash in 9.9 in 1935, a San Fernando Valley league record that has been tied since but not beaten.

While in high school, he played baseball and football, went out for track, played commercial league basketball, and softball in a park league. He won his letters four years running in football, track and baseball.

Van Nuys High is another alma mater that boasted well-known personalities while Buck was attending. On the campus with him were Bob Waterfield, Jane Russell Waterfield, and Marilyn Monroe.

During World War II, Marilyn Monroe worked for Northrop Ventura and Buck knew her there too.

He's spent 22 years with Northrop, and December will make it 23. His first job was as a general assembler at Northrop Ventura, and since he has worked as tool and jig maker, certified welder and leadman in final assembly and shipping.

Buck belongs to the Northrop Ventura golf club and he's collected a dozen trophies in six years of A flight monthly competition, playing currently with an 11 handicap.

"I enjoy golfing more than I ever did any of the sports I played in school," he said. "It's a game you can keep learning no matter how long you keep at it."

APPOINTMENTS

Evans, Burke, Jacobs In New Assignments

Three appointments affecting Northrop Ventura have been announced.

John E. Evans, formerly chief of Test Engineering and Field Operations, has been named director of the Experimental Fabrication section. He also serves as acting chief of the Fabric Fabrication group.

Paul A. Jacobs, director, Experimental Fabrication section, has moved to Norair as deputy division program manager for the F-5 CASA in the F-5/T-38 Division Programs organization.

Stiles Burke, who had served as acting director of the Experimental Fabrication section, has become chief of International Programs, Marketing department.

Mr. Evans has been with Northrop almost continuously since 1948, 11 of those years with the Ventura Division.

With Northrop, he has organized, staffed and managed field test projects and organizations at the Atlantic Missile Range, Pacific Missile Range, White Sands Missile Range, McGregor Range, Edwards Air Force Base and at military installations in Hawaii, Alaska, Panama, the Central Pacific and Far East theatres.

Before coming to Northrop Ventura, Mr. Jacobs had been director of Operations at Nortronics. A member of the Society of Automotive Engineers executive committee manufacturing forum, he joined Northrop in 1940.

The International Programs chief, Mr. Burke, will continue his activities as director of the Northrop Ventura—Aerazur joint effort for research, development, and production of recovery systems in Europe. He came to Northrop in 1951. He will handle all of the Division's international sales.

Additional appointments at Northrop Ventura include those of William L. Bridwell as chief, Test Engineering and Field Operations group, at the same time continuing to act as supervisor of the Field Test branch.

Bernard R. Swift has become chief of Compensation on the Industrial Relations staff and M. E. Stine is appointed supervisor of the Tooling and Methods group, Manufacturing Engineering section.

Scratch Keg League Teams 7, 9 Leading

Teams 7 and 9 of Northrop Ventura Bowling Club's 630 scratch league shared league top position during the sixth week with 13 games apiece to their credit.

High series was claimed by Team 1 for the second week running, with a 1912, lower than their 1981 of the previous week, but still good enough.

High game went to Number 2, the Scavengers. Their 671 duplicated Team 5's high game score of the previous week.

Individual honors belonged to Jeff Stiles of Number 3, the Goofers, with a high series of 546, and to Deane Haddon of Team 4, with the dealer's fleet sales man-

During the fifth week of play, Team 7 stood alone at the top of the league with 12 wins to their credit. They maintained their entering average of 634 to top three foursomes with higher fifth week averages. Number 6 had chalked up a 664, Team 5 a 651 and Team 9 a 645.

Team 5 remained in second place for the second week running with 12 games tallied.

1966 Automobiles At Discount Rates

Northrop Corporation employees may purchase 1966 automobiles at fleet discount prices through a unique arrangement called the fleet discount purchase plan.

A reference manual, listing car dealers taking part in this plan is currently available at various locations. Buyers may check this manual for listings of nearby dealers and obtain a reference card prior to making appointment with the dealer's fleet sales manager. In addition to the purchase of the car at fleet price, optional equipment is also available at cost.

The reference manuals may be consulted and cards obtained at the following Northrop locations: Norair and Nortronics Hawthorne, Personnel Activities at Plant One; Ventura, the Credit Union office; Nortronics Anaheim, Personnel Activities; Mariposa, Polly Middleton; Palmdale, Tom Post; Edwards AFB, Kelly Burke; NSL, Personnel office (Kate Russell); and Arlene Lewis, Corporate office.

RECORD FOR WOMEN

Frieda Mooring: Her First 25 Years

When Frieda Mooring observed her employment anniversary recently she put another entry on the Northrop Corporation calendar of landmarks: she is the first woman to complete 25 years with the company.

Mrs. Mooring

Mrs. Mooring began her career with the Corporation in 1940, the year following its formation. She was the second employee in Accounts Payable, then located in Plant One, Hawthorne. She is still in Accounts Payable, but now as administrative assistant to Jack Bracey, general supervisor of the organization at Nortronics Hawthorne.

Mrs. Mooring remembers the influx of accounting work resulting when Northrop acquired its first military prime contract in 1940, less than a year after the company was formed. Northrop was to design and build the N-3PB, a high speed military seaplane, for the Norwegian Government, the same plane that played a major role in the sinking of the German battleship, Bismarck.

In her 25 years with Northrop, she has served under six immediate supervisors and worked at a variety of locations. After Plant One, she moved to the Mode O'Day building in downtown Los Angeles, while the group was expanded during World War II. She moved back to Plant One; to a leased office on Hawthorne Boulevard; to a facility on Maple Street near the International Airport, now known as the Mariposa building; to Research Park, Palos Verdes; to "the barracks" near Plant Two, since torn down; into Plant Two, and finally to her present location in building A-6 at Nortronics Anaheim.

"The biggest change I've seen in our group is the acquisition of our IBM 632 system. It permits us to do our own accounts recording and write our own checks, speeding up payments.

"Outside of that, there aren't many changes in the accounting business. But there is a great deal of personal satisfaction in watching your work and the work of others help make the company grow."

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California Vol. 23, No. 20 November 17, 1965

New Officers Of M-C Are Already Busy

The 1966 Management Club officers won't be installed for another two months, but they are already at work in developing another eventful year of activities at Northrop Ventura.

"You almost have to work a year ahead to get the kind of programs we want," says Bill Young, the man who will succeed Bill Green as president of the 300-member organization.

Mr. Young was elected to the post earlier this month along with Don Archer, first vice president; Ron Waters, second vice president; Chuck Olmstead, treasurer; and Eileen Munro, secretary.

When asked what would be the possible areas of emphasis for the Club in the coming year, Mr. Young said that the role of the Management Club in Northrop Ventura affairs would come in for serious study, and a program to let every member know just what the Club does for the individual would be emphasized.

Along these lines, Mr. Young said a greater effort would be made for closer contact between the Club and top management, as well as management clubs from other divisions.

Mr. Young, who served as first vice president this year, said that scholarships would again receive attention.

The Club annually awards two scholarships to "students living under the roof of Management Club members." The B. J. Angell award is for $750, and the Vivian Long Memorial award is for $250.

Among revisions and additions to the Club bylaws which were passed on the same ballot as the officers this month was a measure which strengthens and fixes the Club's scholarship policy, Mr. Young said.

(The other bylaw changes concerned elections and membership).

Immediate task of the new officers is to begin working with the 1965 club executives on the upcoming dinner dance, scheduled December 4 at Las Posas Country Club in Camarillo.

The new officers will have some

(See ELECTION, page 6)

FIRST EXPLORER MEETING

Initial meeting of sponsors and interested youths in new special Interest Explorer unit met at Northrop Ventura this month. Dinner meeting in Northrop Ventura cafeteria drew 34 boys, their parents and special guests. At head table (from left) are: Richard Moser, Boy Scout District executive; Paul S. Bicket, director of Exploring; George F. Douglas, Northrop vice president and Ventura general manager; David N. Wuerth, chairman of Boy Scout County Explorer Committee, H. E. Riggins, Northrop Ventura vice president—Administration; Mrs. James McElmurray, and Mr. McElmurray, boy's counselor at Thousand Oaks high school. Ventura Division is sponsor of the post.

You'd Never Know It Wasn't the Real Thing To Watch Apollo Drop Test at El Centro

You'd think they were getting ready for a trip to the moon—with the pains Northrop Venturans take at both El Centro and Newbury Park to ready a drop test of the Division's parachute landing system developed for Project Apollo.

When a drop is planned the entire El Centro Field Test branch, under the direction of Con Harley, base administrator, moves as a team.

The Technical Support unit, Lloyd Simpson, supervisor, must schedule the drop with the USAF 6511th Test Group, a tenant of the Naval Air Facility command, which coordinates the use of the Tactical Air Training Unit (TATU), the test range. By this time Technical Support has already established a detailed flight test plan.

Douglas Aircraft is notified to send from Long Beach the C-133 modified to handle an Apollo boilerplate or parachute test vehicle.

It takes approximately two weeks to ready the boilerplate for test, and the weeks preceding the drop are busy ones for Vic Matakas and his men in the Field Test unit.

His staff installs and rigs the chutes and pyrotechnics. They check out the electrical system and check out and install the instrumentation.

The apex cover ejection system and forward heat shield are completely refurbished. A new aft heat shield, expended in each drop to protect the capsule, is installed on the hydraulic shock struts which extend it from the capsule during a drop to cushion the landing shock.

During the test, Field Test receives instrumentation signals and records data, supplementing the on-board recordings and the NAF data collection effort.

The day before the drop, the boilerplate is hoisted through a gaping opening in the C-133 rear

El Centro: Barren land of the Drop Test . . . page 3

fuselage. The doors have been permanently removed to accept test vehicles. The boilerplate is locked in place, preflight checkout completed, and the aircraft takes off with a Field Test unit member along as prelaunch and launch observer.

After the drop it is the unit's task also to recover the capsule and fabric test items from the impact area.

Packing of the chutes being tested requires a degree of care and capability that is pushing the state-of-the-art to its farthest perimeter. This job falls to the Parachute Loft crew headed by Orville Reed.

Each step is checked by Mr. Reed, by NASA and North American Aviation quality control inspectors, and by a Northrop QC inspector. The Northrop Ventura QC man may be either Doug Henwood himself, head of the group, or one of four inspectors stationed at El Centro.

It takes 27 or more hours to get each main parachute ready for inclusion in the complete recovery system.

(See DROP TEST, page 6)

Archery Club Plans New Hilltop Range

Northrop Ventura Recreation Club will have a new archery range early next year, close to the old one past the end of Rancho Conejo Boulevard.

Dale Milligan, Archery Club commissioner, reports that a hut, targets and yard markers will be installed.

The new and old range both lie between the golf driving range and a line extended straight from the end of Rancho Conejo Boulevard past the Ventura installation.

N-V Contract Awarded for ASW System

Working under a contract exceeding $1 million, Northrop Ventura is developing an electronic system to improve anti-submarine warfare techniques.

An Interim ASCAC or Anti-Submarine Classification Analysis Center system will be designed and developed under direction of the Naval Air Development Center, Johnsville, Pennsylvania.

"This contract is the first step in what we hope will be a growing new field of endeavor at Northrop Ventura," said George F. Douglas, Northrop vice president and Ventura general manager. "We are aiming a great deal of effort toward development of both ASW information systems and unmanned underwater vehicle systems."

Heading the ASCAC effort is Herbert H. Halperin, project manager, who also has responsibility for related command / control programs and other ASW activities sponsored by Northrop Ventura in business areas directed to Naval operational problems.

Mr. Halperin

Project engineer is D. K. Welch, with C. D. Conyers performing as chief of Systems Analysis. G. J. Ellerbe is program coordinator and Irwin Gerst has charge of project control, including estimating, scheduling and planning.

Al Alspach has the responsibility for Interim ASCAC manufacturing operations; Andrew McNeir is contract administrator; and Harry Vickers is responsible for Quality Control.

The purpose of the Anti-Submarine Analysis Center is to provide rapid, accurate identification of contacts made by anti-submarine surveillance units.

ASCAC would be located on shore or shipboard and would coordinate data received from a number of sensing points. Trained personnel would be provided with the necessary "tools" and environment with which to interpret the information more accurately and rapidly than is presently possible.

As project engineer, Mr. Welch is responsible for detailed design and test of ASCAC hardware. Mr. Conyers' task is to provide

(See CONTRACT, page 6)

NEWS Adopts Revised Publication Schedule

In order to afford maximum coverage of the many traditional yearend activities throughout Northrop, a revision in NORTHROP NEWS publication dates for the remainder of 1965 has been adopted.

NEWS editions will be distributed December 8 and December 22. Deadlines for copy and classified advertisements will be November 24 and December 13 respectively.

BENNETT HELPS DRAFT POLICY

Laymen Study Religion on a World Order

Selected as one of 12 national delegates for the Lutheran Church in America, Walker G. Bennett attended the sixth World Order Study Conference of the National Council of Churches in St. Louis, Missouri. The four-day conference concluded last month.

Mr. Bennett

Mr. Bennett, chief of Technical Administration at Northrop Ventura, is secretary of the Board of Social Ministry serving five western states for the Lutheran Church.

At the religious meeting he worked with other church laymen to prepare papers on subjects of world significance for presentation to the National Council of Churches.

Purpose of the World Order Study was to examine crucial world problems and attempts to determine the responsibilities of Christian churches regarding these problems.

Four hundred delegates from 18 Protestant churches, as well as Catholic and Jewish observers, came together for the event in St. Louis.

Mr. Bennett attended a previous such meeting, the fifth World Order Study Conference at Cleveland in 1958. Serving his second two-year term as secretary of the Board of Social Ministry, he has been a board member for some five years.

Meeting most often in Los Angeles, the board has responsibility for allocation of funds to Lutheran homes for the aged, hospitals, orphanages, and for emergency aid in the five states it serves.

DOING THE CONTINENTAL

On October 20 some 140 Northrop employees and family members boarded this waiting Air France jet to take part in the annual NRC-sponsored European excursion. They returned November 7. Between those dates 63 took part in a tour of Southern Europe, 10 traveled to Spain and Portugal, and the remainder spread out to visit their favorite European spots on their own. Next NRC-sponsored tour is a Hawaiian visit during the long yearend holiday.

OVER THREE COUNTIES

Five J-A Firms Get Division Support

Northrop Corporation, a participant in Junior Achievement activities continuously since they were introduced in Southern California 12 years ago, is once again supporting this important youth activity.

This year, as in the years just passed, Northrop's interest spans three counties—Los Angeles, Orange and Ventura. It includes five Junior Achievement companies in which more than 100 teenagers are active.

Junior Achievement is a nationwide businessmen's program of economic experience in which teenagers learn about the American system of private enterprise by operating their own small-scale corporations. Youngsters form their companies, elect officers, select and manufacture a product, then market that product. Operating funds are procured through the sale of stock which is redeemed at the end of the year.

Industries, like Northrop, may support this program by two major means. One is to become a sponsor, a donor of funds to support the over-all program. The other is to provide counselors who actually work week-to-week with the youngsters.

Northrop is both a sponsor and counselor.

Counselors selected for this program are Northrop men who volunteer their time and effort, often working long hours to make the program a success. They are, in all respects, the true "backbone" of Junior Achievement.

Each of Northrop's three major divisions in Southern California are active in Junior Achievement. Northrop Norair and Northrop Nortronics each sponsor and provide counselors for two companies, while Northrop Ventura provides the same services for one company—the only firm thus far established in Ventura County.

The two Norair-sponsored firms, plus one sponsored by Nortronics Hawthorne, meet at the Southwest Junior Achievement Center in Hawthorne. The others meet in their respective counties.

Norair-sponsored firms this year are called Minico and Verse Kraft. Minico will produce and market a Christmas candle table decoration. Its officers, elected by the teenagers, are Terry Gilbert, president, Gayle Johnson, secretary, and Shirley Harshaw, treasurer. Counselors or advisers are John Patrick, management, Hal Maninger, sales, and Jim Crase, production. Verse Kraft officers are Michael Di Donato, president, Paula Combs, secretary, and Rozellen Bancroft, treasurer. Ad-

(See ACHIEVEMENT, page 5)

Reservations Scarce For Hawaiian Tour

Only a few reservations remain on the NRC-sponsored Christmas tour of the Hawaiian Islands. Final arrangements will be made for their tour at 7:30 p.m. December 3 in a meeting at NRC Clubhouse, Hawthorne.

At that time some lucky traveler, from among those who have booked space on the tour, will be selected for a free trip.

Departing December 24 and returning January 2, the tour will include visits to four islands, many sightseeing trips, etc. The cost is $378 per person and includes jet air travel, transportation, lodgings, some meals and side trips. Contact Personnel Activities offices for information.

LES BROWN TO PROVIDE MUSIC FOR ANNUAL CHRISTMAS DANCE

The International Ballroom of the International Hotel will be the setting December 11 for Northrop's big social event of the year—the annual Christmas holiday dance.

Northrop Recreation Clubs are combining their efforts to present this gala affair from 9 p.m. to 1:30 a.m.

Les Brown and his "Band of Renown" will provide the music with a special Latin orchestra performing during intermissions for those who cater to a more bouncy beat.

Les Brown

The cost per person is a modest $2.10, thanks to NRC sponsorship. Tickets are now available at all normal ticket outlets throughout Northrop facilities in the area.

Special arrangements are also being made for parking. With validated parking tickets, the price is only 50 cents per car for self-parking and $1 for valet service.

The huge International Ballroom, seating 1350 in comfort and luxury, will be reserved for Northrop personnel and their guests. However, tickets are being offered on a first-come, first-served basis.

Dinner will not be served in the International Ballroom, but Northrop people may make special arrangements for dinner in either the Hunt Room or Penthouse by calling 670-9000 for reservations.

Two Days Remain For Tour Tickets

Only two days remain in which to procure tickets for the all-Northrop day scheduled Saturday at Universal Studios.

Tickets will be available through normal Northrop ticket outlets through Friday. No tickets will be available at the gates.

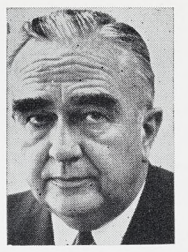
This famed motion picture and TV production center with its many attractions will be reserved exclusively for Northrop families Saturday. Gates open at 9 a.m. and close at 6 p.m. Snack facilities and the studio's commissary will be open for those who care to dine inside the studio.

Features include a motorized tour aboard "Glamor-Trams" to see sets, scenery, sound stages, dressing rooms, etc. There is also a behind-the-scene tour to see how special effects are created for films. The last "Glamor-Tram" departs at 3:40 p.m.

Because of the joint sponsorship of Northrop Recreation Clubs, tickets will cost employees less. Adults will be admitted for only $2, while children seven through 11 years pay $1.25. Children under seven will be admitted free when accompanied by an adult.

FRINGE BENEFITS

A New Look At Retirement



By WILLIAM LARRABEE
Vice President—Industrial Relations

In recent years the company-sponsored retirement plan has become a way of life for the American worker. Back in 1952 Northrop established plans for both its salaried and hourly-paid people which provided, in substance, that a retiring employee under the plans got a fixed number of dollars for life based on the amount of his compensation and his length of service. The company paid the entire cost. The plans had other features, of course, and were fine for their day. As time went on, however, it became apparent that changes could be made which would be to the advantage of all of our people.

A problem then common to almost all plans was that they provided for a fixed number of pension dollars without taking into account the fact that as the cost of living changed, the dollar payments would not buy the same amount of food and housing as they bought when the person retired.

Your interdivisional Industrial Relations committee investigated every possible solution to this situation. It developed in the course of these studies that pension authorities across the country had been working on a "variable annuity" principle which seemed to offer a way out of the dilemma.

"Variable annuity" sounds pretty complex, and indeed it is in some of its details. The basic theory, however, is not complicated at all. It was proven statistically over the years that the prices of equity securities, for the most part common stocks, rose and fell at roughly the same time and rate as the cost of living. It followed that if pension funds were invested in equity securities and the retiree's pension went up and down with the value of those securities, the pension would maintain a much closer relationship to the cost of living.

Your committee concluded that we should go to the variable annuity principle but that we should not put all of our pension eggs in one basket by investing everything in common stock. It recommended to management, therefore, that part of the retirement income still remain in fixed dollars which, when tied in with Social Security, would give a specified dollar income to the retiree. It recommended that the remainder of the pension funds be invested in equity securities so that the retiree would have some hedge against cost of living changes.

As a result, our plans were so amended in 1957, which put Northrop in the forefront of our industry in this regard. As it turned out, it is fortunate indeed that our management stepped in and recognized this problem when it did. We all know what has happened to the cost of living since 1957.

Many of us have retired friends who are tied absolutely to fixed pensions and who have seen the real value of their retirement pay dwindle in terms of what they can buy. Thanks to the foresight of our people, our men and women retiring after the effective date of this change have had a degree of protection which others lacked over these intervening years.

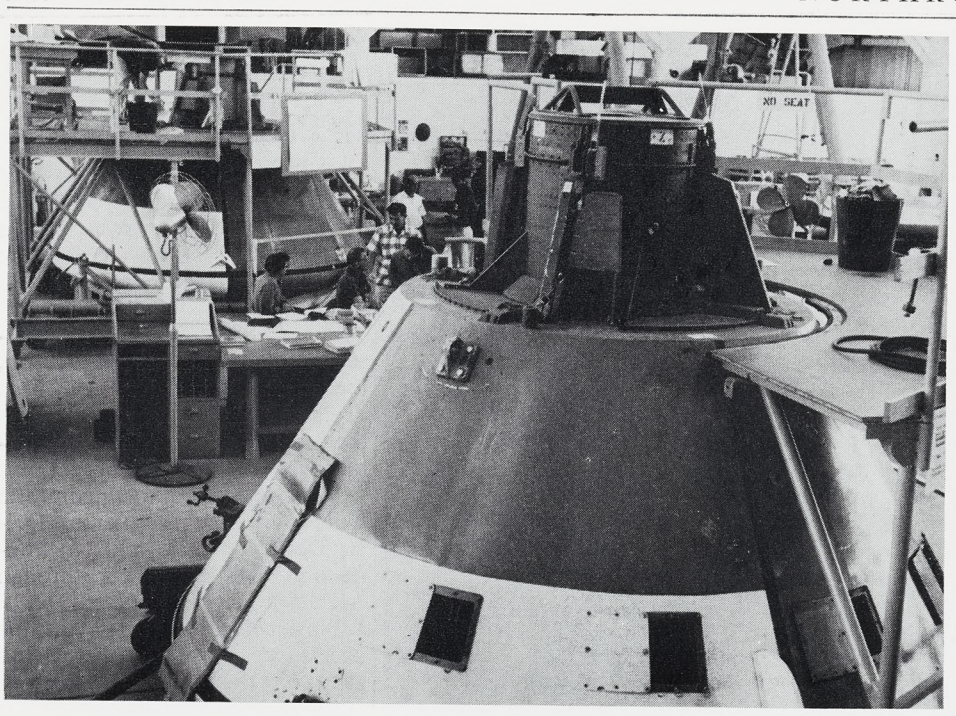
Since 1957 our plans have been amended several times to make them better and more workable. Recently, however, trends have been developing which indicate that we should take a strong look at some further important changes.

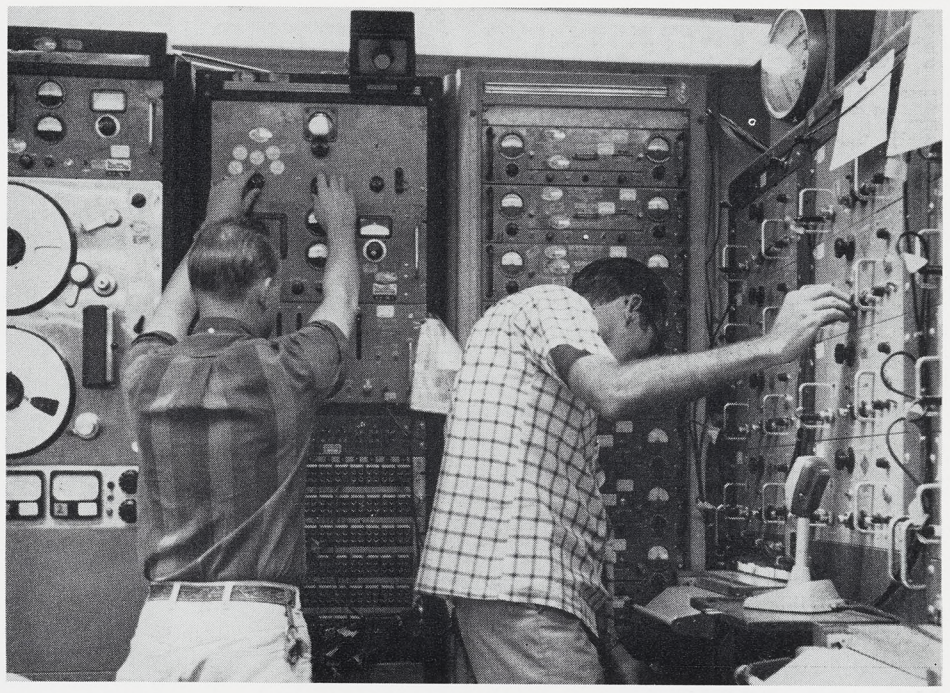
For instance, inflation has pushed salaries and wages up, and yet many people retiring in the future will find their pensions under industry plans based in part on the rates of pay they had many years ago. Furthermore, early retirement is permitted under most plans, including ours, but the financial penalties for retiring early have been so stiff that few people take advantage of this right. Additionally, the Government has raised the rate and the wage base for Social Security taxes very substantially, due in large part to the Medicare bill.

This year the company and we, as employees, are each paying 3.625% on the first $4800 of our earnings ($174). In 1966 we and the company each will be paying 4.2% on the first $6600 of our earnings ($277.20). The increase in the base from $4800 to $6600 would actually reduce our future retirees' pensions unless we take action, since our pensions are figured, in part, upon a percentage

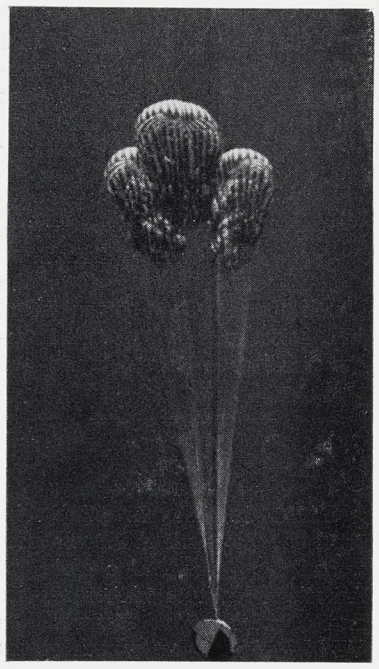
(See FRINGE BENEFITS, page 5)

INDUSTRIAL RELATIONS COMMITTEE—Northrop's four Industrial Relations directors are responsible for working out details of fringe benefits, including retirement. From left, Paul Crews, committee chairman, is Norair director; Frank Smith is Corporate director; Rex Fairless is at Northrop Ventura and Elmer Noonan is at Northrop Nortronics.

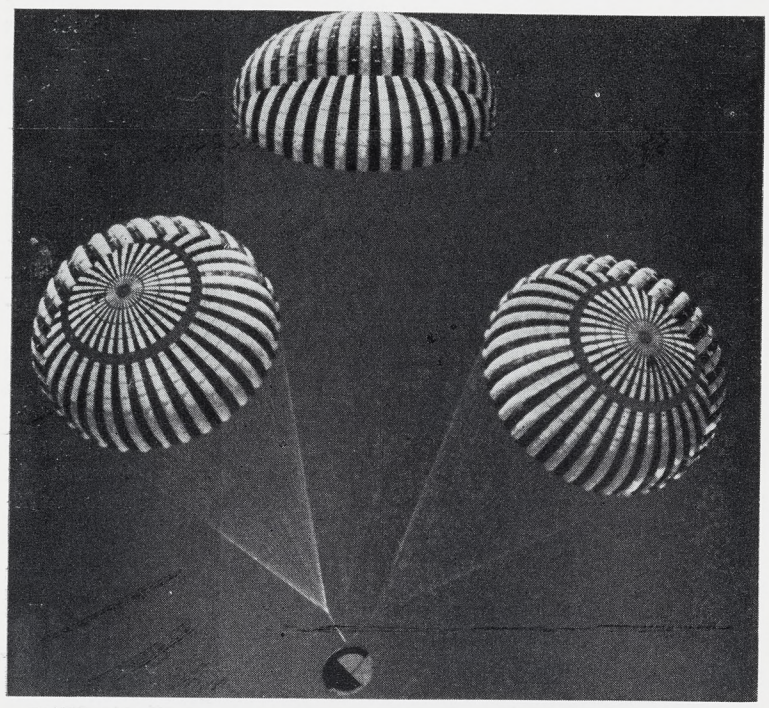




THE BIG PICTURE—Hangar 225 (left photo) at El Centro test facility is a center of activity in preparing for drop test. Among functions performed here is boiler plate refurbishment, ELS equipment installations, airborne systems checkout. Also in hangar is telemetry ground station (right), where Clay Robinson and Wal Masters are preparing for test. Station provides "quicklook" data of test parameters during drops.



Chutes deployed (above), it remains only for pyrotechnic cutters to actuate, permitting full opening of main chutes (below).



EL CENTRO, USA

Hot Barren Land of the Drop Test

By ROBERT STEINGART
Northrop News Staff Writer

A parachute landing system test area requires almost limitless flat, uncluttered territory and good flying weather throughout the year. Where these requirements are concerned the Naval Air Facility (NAF), El Centro, stands unopposed.

Mile on mile of seared earth, sand and ground hugging brush stretch toward the mountainous horizon, with no sign of human habitation. Official temperatures in summer hover at the 120 degree mark. Humidity is practically nonexistent.

Even at summer's end 95 degrees in the shade registers on thermometers — and the desert brush offers no shade.

This parachute test facility lies on the rim of the parched Arizona Desert, near the city of El Centro, California. The Chocolate Mountains and the Superstitions brood at its flat edges, perhaps still hiding the whitened bones of prospectors from an earlier period.

But the heat and isolation make little impression on a team of Northrop Ventura specialists working within the confines of the facility. To them NAF is just another test station where they can carry out their role, producing earth landing systems for the U.S. space program with a minimum of outside interruption.

During World War II the desert drop area was utilized as a Tactical Air Training Unit (TATU) drone-flying zone. It sits on the edge of the El Centro Naval Air Facility. Functionally part of NAF, it passively accepts the impact of Apollo parachute test vehicles and boilerplate capsules.

Before Apollo, a multitude of parachute-suspended test items were dropped at TATU in hundreds of tests, usually to be redeemed and dropped again.

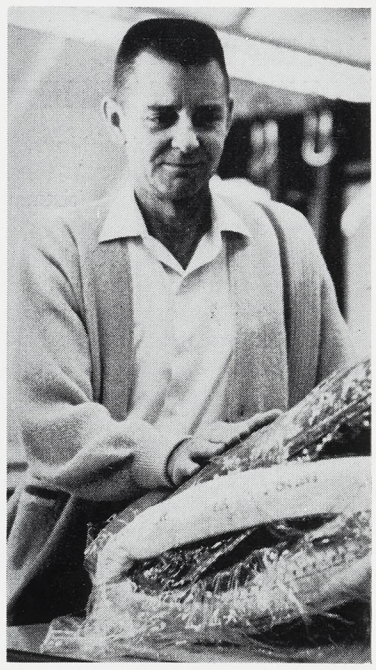
There have been Ventura people at NAF, El Centro, intermittently since 1948.

Mercury's parachute system utilized NAF to the fullest, and in 1962 Gemini program drops began, to run almost continuously until early this year. Two of the Gemini tests moved the Northrop staff northward to the Salton Sea for simulated ocean landings.

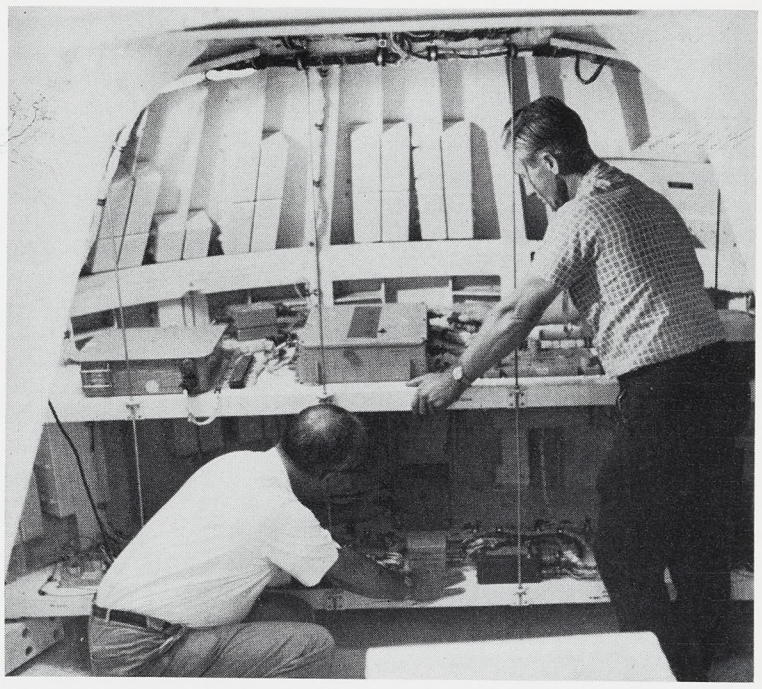
While Gemini was still on board, in 1962, the first series of Apollo tests began and the programs ran simultaneously until February 1965.

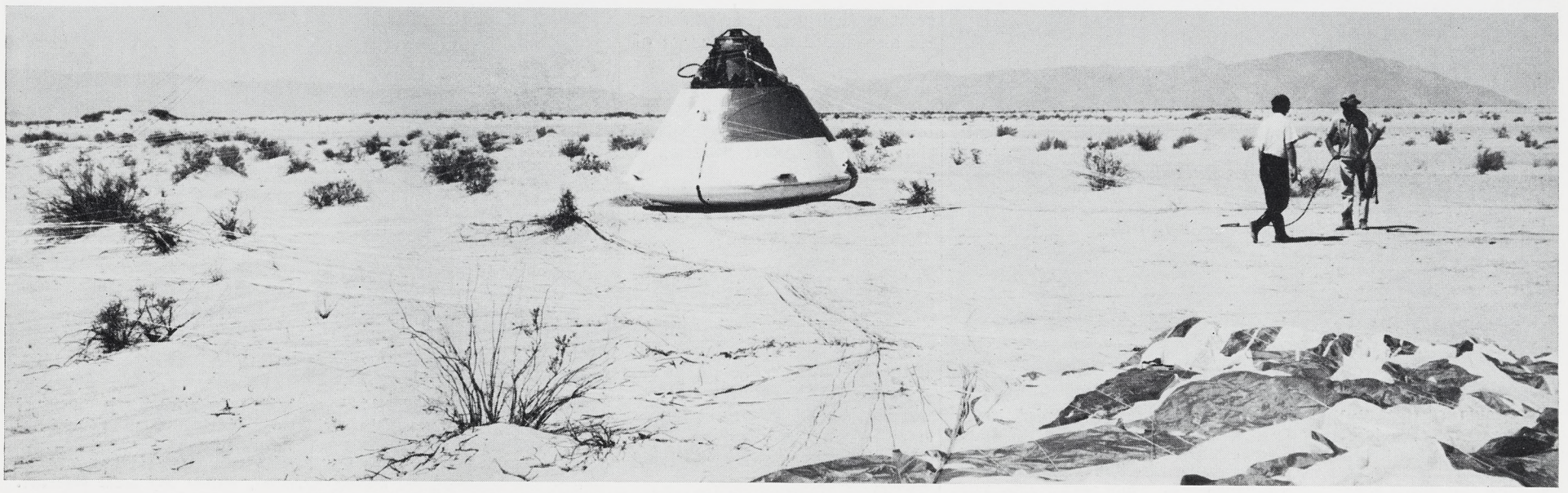
In April 1963 Apollo drop tests came hot and heavy, and a permanent installation was established. The El Centro Field Test branch took over an administration building and converted a warehouse into a parachute loft. A hangar already sheltered work on the boilerplates and PTVs.

The Block I Apollo qualification drop series began in May 1965, with completion in February 1966 anticipated.



Con Harley (above) is base administrator. Looking into interior of Apollo boilerplate (below), George Reardon and Otto Goerish install electrical equipment for drop test.





AND, FINALLY, THE BOILERPLATE TEST VEHICLE COMES TO REST IN A SEA OF SAND.

Page Garners Awards From Comsat, Army

Agreement on two contracts totaling more than $10 million have been announced by Page Communications Engineers, Northrop subsidiary based in Washington, D.C.

The U.S. Army Electronics Command, Ft. Monmouth, New Jersey, has awarded Northrop Page a $5.7 million contract to design, engineer and install an integrated wideband communications system (IWCS) in South Vietnam. The U.S. Army Strategic Communications Command has operational responsibility for the system, Page President Joseph A. Waldschmitt said.

Earlier, the Communications Satellite Corporation announced agreement with Page on a contract for three transportable earth stations to be used as links in providing communication services for Project Apollo. Total cost of the contract is $4,512,772.

Comsat filed the contract for the stations with the Federal Communications Commission in conformity with FCC rules requiring 10 days notice for such awards.

The three transportable stations are designed to be used as part of a proposed system of satellites, and other ground facilities, capable of supporting NASA's requirements of routing Apollo program communications into the space agency's control center in Houston, Texas, no later than September 30 of next year.

Filings by Comsat are pending before the FCC to purchase four satellites from Hughes Aircraft Company for the space portion of the system. The spacecraft would be capable of providing other commercial satellite communications in the Atlantic and Pacific.

The three transportable stations with 42-foot Casshorn antennas would be located at Andover, Maine, Brewster Flat, Washington and Paumalu, Oahu, Hawaii.

In announcing the IWCS program, Mr. Waldschmitt said target date for completion is early 1966. A Page survey team—supported by a full-time Page staff headquartered in Saigon—has been sent to the area to establish site locations and determine specific design requirements.

IWCS will comprise tropospheric scatter, microwave links and technical control facilities capable of simultaneous voice, teletype, data and facsimile transmission at the high quality standards established by the Defense Communications Agency.

A pioneer in worldwide communications systems design, installation and management, Page gained early experience in communications requirements peculiar to the geographical area of South East Asia. For the U.S. Military services in 1962, Page built the ten-terminal Back Porch tropo system and delivered it on schedule, seven months from the date of contract award to completion and turnover to the military.

Page will further expand the Back Porch System under requirements of the new IWCS contract.

NRC TO SPONSOR HOLIDAY SEASON BOWLING TOURNEY

Entries close Monday, November 22, for the 12th annual Northrop Corporation Christmas Bowling Tournament.

Northrop Recreation Clubs are sponsoring this big event which is open to all Northrop employees and their families. It will be held December 11 and 12 at Tropicana Lanes, 11163 Prairie Ave., Inglewood.

Entry blanks are currently available through NRC outlets.

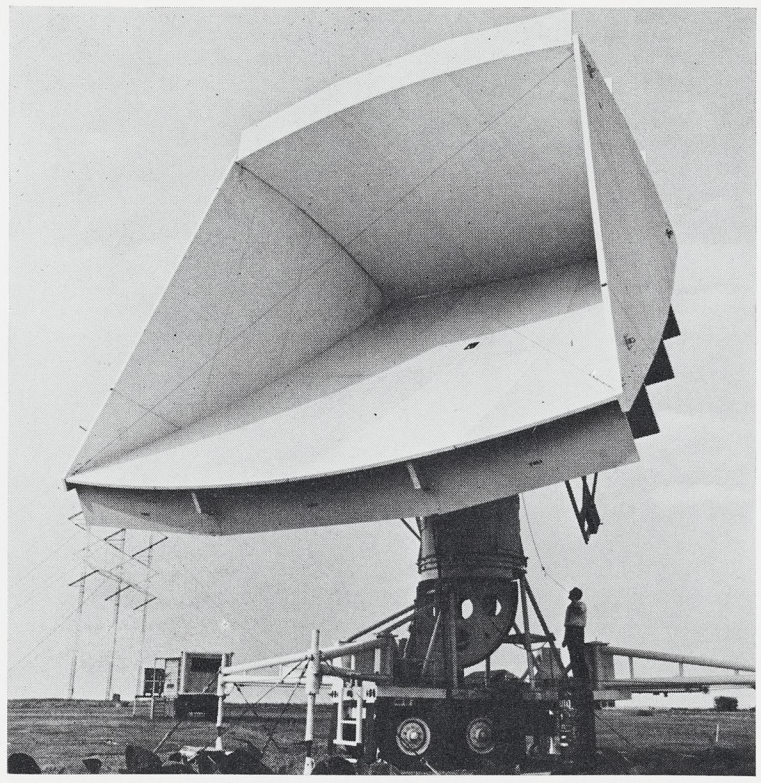
Plans call for "A" and "B" divisions in men's and women's singles and doubles events and in mixed doubles. Entry fee is $2.75 per event.

Trophies will be awarded first-place winners in each division and also for individual high over-all, high scratch series, high scratch game, high handicap game and most pins over entering average. In addition, a special door prize will be awarded at the end of each squad rolling.

Schedules will be available December 6 and will call for squad times of 10 a.m., 12:30 and 3 p.m. each day.

The 1965 tournament committee is made up of Bob Arrasmith and Dorothy Baldwin of Nortronics; Bill Myerson and Vi Jennings of Norair.

Entry forms may be obtained from and submitted at any of the following locations: Personnel Activities at Norair; Personnel Activities at Nortronics Anaheim; Personnel offices at both Nortronics Hawthorne and Palos Verdes; the Northrop Ventura Personnel Services office; and Industrial Relations at Palmdale and Edwards Air Force Base.



APOLLO COMMUNICATIONS—Northrop Page—developed antenna is key to new contract with Communications Satellite Corporation for transportable earth stations to be used as links in providing communication services for Project Apollo. Horn shape is unique characteristic of antennas, which will be located in Maine, Washington, and Hawaii.

EMPLOYEES URGED TO STUDY NEW MOTOR VEHICLE LAWS

Northrop's safety directors at Norair, Nortronics and Ventura divisions have urged employees to become familiar with new motor vehicle laws enacted by the 1965 California Legislature.

Most important among these, according to the directors, are:

—Dimming lights: headlight beams must be lowered when following another vehicle within 300 feet, a change from 200 feet.

—Slow moving vehicles: On a two-lane roadway, a slow vehicle followed by five or more vehicles must pull to the side wherever sufficient area exists for a safe turnout. On a multi-laned roadway, a driver of a car traveling slower than the normal speed may be cited if the car is not in the right-hand lane.

—Pedestrians: Pedestrians are prohibited from suddenly leaving a curb or other place of safety and walking or running into the path of a vehicle which is close enough to be an immediate hazard.

—Litter: The owner of a vehicle, or its driver if the owner is not present, is responsible if he aids or abets the throwing of any litter from the vehicle.

—Registration fees: Basic registration fees beginning in 1966 will increase a dollar a year through 1968.

The new laws went into effect September 17.

Las Vegas Trip Is First Prize In Slogan Contest

A week end for two in Las Vegas is top prize this year in the annual United Crusade slogan contest. All Northrop employees in Southern California are eligible to compete.

Sponsored by the United Crusade Industrial Press Committee, the contest is based on 25 words or less, telling why you support the United Crusade through Northrop in-plant charity programs.

Northrop Ventura supports the United Crusade through its Dollar Donor program and Nortronics and Norair divisions through AID.

No special writing ability is necessary to win, and there is no limit on the number of entries from each participant.

First prize this year is provided by Holmes & Narver, Inc., and consists of round-trip air transportation, hotel accommodations for two nights at the Hacienda Hotel and an expense check for $100.

Thirty other prizes are being offered, including merchandise, cash and U.S. Savings Bonds.

Entries should be sent to the Northrop News, Organization 170, Beverly Hills, before December 3. Winners will be announced early next year.

Adcock Lectures On VTOL Vehicles

Clifton L. Adcock, chief, Aircraft Development at Norair, presented the second of a series of American Institute of Aeronautics and Astronautics lectures on VTOL vehicles last month at the AIAA auditorium, 7660 Beverly Boulevard, Los Angeles.

Mr. Adcock, with 18 years in the aerospace industry, directs Norair V/STOL activities. He offered information on direct lift and vectored turbojet engines as an approach to high subsonic or supersonic VTOL aircraft.

AT ANNUAL DINNER

Northrop Scout Supporters Commended

The continued interest of Northrop Corporation and its leaders in the future of Boy Scout activities was evident last week as the Centinela District held its annual recognition dinner at the Airport Marina Hotel.

Thomas L. McCarthy, Norair manager of Administration, received special commendations and a plaque recognizing his leadership (for 2½ years) as District Chairman.

Richard Iseminger, District Scout executive, lauded Mr. McCarthy for his long service, noting the Centinela District has made great strides under his guidance. He also added a special word of praise for Welko Gasich, Norair vice president and assistant general manager — Technical, whom he described as the "father of Special Interest Explorer Scouting in Los Angeles."

Succeeding Mr. McCarthy as chairman is William Drake, vice president and treasurer of Aerospace Corporation.

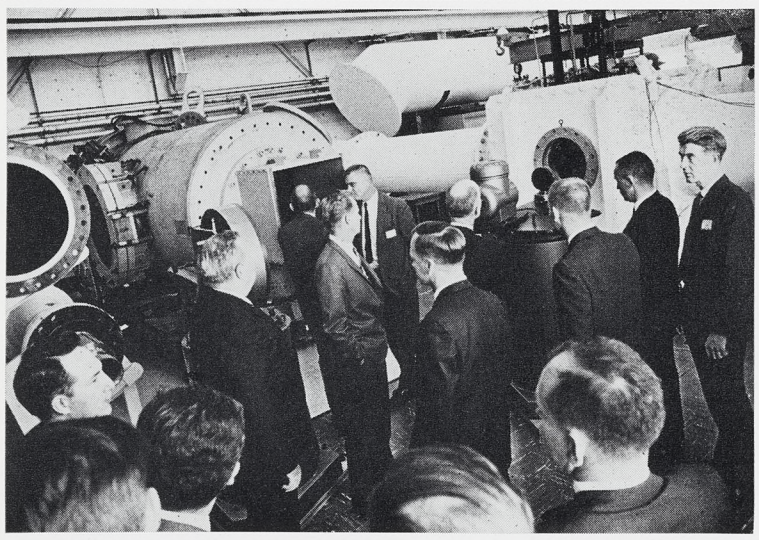
Richard Nolan, Northrop senior vice president, made a special report in his capacity as district nominating committee chairman at the dinner.

Northrop Corporation leaders will continue to serve the scouting world during the coming year, with no less than seven accepting special posts.

Richard E. Horner, Northrop senior vice president and Norair general manager, and Richard Pryor, general supervisor of Personnel Activities, will serve as district representatives to the Los Angeles Area Council.

Named Centinela District members-at-large were Mr. McCarthy, Milton Kuska and Arnold Sorenson (a consultant) at Norair, Elmer Noonan at Northrop Nortronics, and Victor Cherbak of the Corporate office.

The annual recognition dinner was attended by some 500 leaders of all elements of scouting. Highlight of the evening was the presentation of special honors to six volunteer leaders for their contributions to scouting.



SUPERSONIC SETTING—Northrop Norair's hypersonic-supersonic wind tunnel complex, above, was interesting focal point during tour November 1 when participants in 24th Semi-Annual Supersonic Wind Tunnel Association meeting visited Norair. Meeting drew international group with Paul Jensen, chief of Research Laboratories group as general chairman for entire two-day affair held at Airport Marina Hotel. Norair was host for meeting.

LEADERS PLAN SCOUT PROGRAM—Thomas L. McCarthy (right), Norair manager of Administration, recently completed 2½ years as chairman of the Centinela District, Boy Scouts of America, Los Angeles Area Council. He goes over plans for annual recognition dinner with Sidney Handler, left, dinner chairman and new District vice chairman, and Richard Iseminger, District Boy Scout executive. Seven Northrop Corporation men will serve Centinela District during coming year.

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills.

Classified

Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Ring & pinion gear, 3.36 1 ratio for Chevrolet, $25. Torrance, 324-5698. A

Plymouth, 1958, 9-pass. wagon, Suburban, all-power, $550. Hermosa Bch., FR 9-7342. A

Ford Fairlane, 1959 convt., new p/b & p/s, r/h, $275. L.A., PL 4-4052. A

Roller Skates, shoes, ladies size 7, $20. Hawthorne, 675-1057. A

Piano, practice, upright, $110. Brea, 714-529-1436. A

Buick Special, 1956, new battery, shocks & smog device, good tires, $325. Inglewood, 677-8456. A

VW Bumpers, front or rear, complete w/ guard, $24. Huntington Bch., 714-897-8201. A

Chevrolet, 1955, 2-dr., auto. 6, r/h, new paint, $140. Canoga Pk., 348-6037. A

Opportunity to obtain pvt. pilot's license at minimum cost as part owner of late model aircraft, $250. Manhattan Bch., 379-2649. A

Volkswagen sedan, 1965, w/s/w, $1675. Inglewood, 673-1589. A

Camera, Polaroid, $35. Buena Pk., LA 1-4711.

Apt. House, 32 units, deluxe, pool, patios, 6-yrs.-old, $359,000. Hawthorne, OS 9-7909.

Falcon ranch wagon, 1962, new paint, $800. Box 2001. A

Figure Ice Skates, boy's size 6, $10. Torrance, FR 8-1350. A

Corvette Stingray, 1963, 4-spd., positraction, 340 hp, radio, elec. windows, $2995. Hawthorne, 676-3765. A

Bicycle, girl's, Huffy, 26", $10. Anaheim, KE 5-6990. A

VW sunroof, 1963, $1225. Long Bch., 596-1280. A

Crib & mattress, $15. Lawndale, 371-0194. A

MG Midget, 1964, top, tonneau, r/h, wire wheels, $1695. Torrance, 370-2876. A

Chevrolet, 1958, 2-dr. Del Rey h/top, floor stick shift, $350. Redondo Bch., 374-2433.

Home, 4-bdrm., fam. room, 2 bath, all built-ins, fenced yd., 1-yr.-old, 1 mile to Research Park, ocean view, $41,900. P.V. Pen., 377-5172. A

Hockey Skates, boy's, ccm, size 6, $8. Norco, 735-1232. A

Range, Gaffers & Sattler, chrome top, $75. Torrance, DA 4-0161. A

Trailer, 1-wheel, utility, 4x6 box, hitches inc., $50. Hawthorne, OS 6-1454. A

Guitar, Martin O-18 w/case, $155. Hawthorne, 679-1981. A

House, 4-bdrm., 2-bath, 2½-yrs.-old, $26,500. Torrance, 834-2175. A

Deep Freeze, chest-type, 2-dr., 16 cu. ft., $55. Hawthorne, OS 5-2882. A

Car Radio, for 6-volt car or boat, $10. Hawthorne, 676-0418. A

Chevrolet Impala, 1960, 348, 3-2s, 4-spd., small Ansen steering wheel, $1300. Hawthorne, 675-2514. A

House, 4-bdrm, family rm, sprinklers, professionally landscaped, $36,950. Torrance, 327-2666. A

Triumph Bonneville T 120 TTS, 1964, $875. Torrance, TE 5-8608. A

Pups, beagle, 9-wks.-old, 2 male, 1 female, AKC reg., have shots & papers, $75. Orange, 532-3743. A

Accordion, 120-bass, Bonelli, w/case, $125. Gardena, DA 4-0158. A

Electrical Wiring, 500 ft., 25 light sockets, 1 fuse box, $35. Bellflower, 925-4398. A

Lawnmower, reel-type, Sears, $35. Hollydale, ME 3-2395. A

Camper, 1962, Open Road, overcab, sleeps 4, completely equipped, $795. Hawthorne, 644-3370. A

House, 4-bdrm., family rm., 2½ baths, 1 acre, horses OK, near Northrop Ventura, $35,000. Somis, 805-482-1186. A

Skin diving Outfit, hood, pants & top, size 40-42, 3/16" rubber, $50. complete. Torrance, 323-4257. A

Volkswagen sedan, 1965, sunroof, side mirror, seat belts, radio, 2400 miles, $1925. Long Bch., 633-5938. A

Sewing Machine, Gibbs & Wilcox w/attachments, $85. Box 2002. A

House, 1-bdrm., on R-2 lot, good income property, $9500. Torrance, FA 1-3466. A

Cemetery Plot, dble. interment, 3, Inglewood, $800. Rolling Hills, FR 7-1043. A

Paint Sprayer, 1 qt. w/air compressor, electric oper., $15. Hawthorne, OS 5-6206. A

House, 3-bdrms., family room, laundry, yard, $33,900. Manhattan Bch., FR 9-7775. A

House, 2-bdrm., fireplace, w/w carpeting & drapes, lot 45x145, $21,950. Inglewood, OR 1-3860. A

Playpen, wooden, $12.50. L.A., OR 0-4342. A

Rug, thick English-made oriental style, 12x15 ft., blue & rose, $200. Rolling Hills Ests., FR 8-5175. A

Coffee Table, 52"x22" w/2 step end table set, Danish modern, blonde, $35. Inglewood, 758-8342, 759-7635. A

Stove, O'Keefe & Merritt, gas, chrome top & griddle, storage drwr., $50. Hawthorne, OS 5-2433. A

Falcon, 1960, 2-dr., r/h, 65,000 miles, $399. Santa Monica, EX 3-5983. A

For Sale

House, 2-bdrm., knotty pine living rm., 87'x250' hillside lot, $22,000. Torrance, 375-6634. A

Sunbeam Alpine, 1963, wire wheels, new tires & paint, low mileage, $1300. L.A., MI 5-4163. A

Frequency Meter, VHF-UHF TS 175/U 80-1000 mc, self-contained power supply, $125. El Segundo, 322-6655. A

Plasterer's Scaffold, $50. L.A., OR 1-0574. A

Television, Crosley, mahogany cabinet, 17", continuous tuning, $25. Torrance, FA 8-6839.

Volkswagen, 1964, AM-FM radio, 30,000 mi., $1450. P.V. Ests., 379-5033. A

Plymouth Fury, 2-dr. h/top, 383 cu. in. eng., r/h, p/b, p/s, auto. trans., $1900. Redondo Bch., 374-2915. A

Ford station wagon, 1957 country sedan, r/h, Fordomatic, new tires, T-Bird eng., $225. L.A., PL 6-0015. A

Ford station wagon, 1959, air conditioning, r/h, auto, p/s, p/b, w/s/w, other extras, $595. L.A., 474-3433. A

Home, 4-bdrm., 2-car gar., landscaped, custom interior, insulated walls, $29,950. Hawthorne, 644-1958. A

Cat, pedigreed Burmese female, dble. champion, $25. Garden Grove, 539-9665. A

Honda, 1965, 50cc, elec. starter, windshield, $260. Inglewood, 754-3946. A

Chevelle Super Sport, 1965, 327 cu. in. 4-spd., $2375. Torrance, 329-9249. A

Cemetery Plot, 2, dble. interment, Inglewood Park Siesta sect., $950. Inglewood, PL 6-9532. A

Vacation Trailer, 15' Starfire, sleeps 5, water tank, butane stove, oven & light, $465. L.A., 756-3234. A

Mercury, 1951, recently o/hauled eng., new transmission, $100. L.A., PL 4-0078. A

TV, 21" Hoffman, mahogany console w/doors, $45. Gardena, OS 5-5258. A

Pups, silver miniature poodle, AKC reg., $125. Redondo Bch., FR 6-8327. A

Sailboat, 12' sidney, 18' mast w/trailer, $350. Inglewood, PL 1-8420. A

Row Boat, 12' aluminum Ward's Sea King, 1959 5½ hp Johnson outboard, $215. Manhattan Bch., FR 6-6002. A

Buick, 1963, Le Sabre h/top, auto. trans., r/h, p/b, p/s, w/s/w, air conditioned, e-z eyeglass, $2095. Redondo Bch., 378-9741. A

DeSoto, 1956, p/s, p/b, auto. trans., good body & tires, $75. Lawndale, 371-3991. A

Sloop, 24' Herreshoff, sleeps 3, galley, teak decks, inboard auxiliary, rare h/woods, many extras, $6100. San Pedro, TE 3-6037. A

Bicycle, boy's Huffy, $10. Brea, 529-3531. A

Table Set, 36"x36", w/8 chairs & 1 oak bench, $30. Gardena, DA 9-7447. A

Ford station wagon, 1958, rebuilt motor, 4 new tires, $600. L.A., 775-2827. A

Chevrolet Impala, 1961, h/top, p/s, p/b, $875. Torrance, OR 0-1515. A

Chevrolet, 1950 Powerglide, 2-dr. sedan, $65. Torrance, DA 4-9087. A

Ford station wagon, 1957, Country sedan, $300. Culver City, VE 8-9087. A

Drafting Machine, Brunning, plastic scales, $45. Bellflower, ME 3-6106. A

Styrofoam Boards, 1"x12"x12', $1.20 bd. Malibu, GL 6-2559. A

Ford, 1955, p/s, r/h, auto. trans., 4 chrome mags, $400. Hawthorne, 676-9394. A

Land, Antelope Valley, 5-acre parcels near Willow Springs, terms, $520 acre. Torrance, FR 8-1026. A

Enlarger, Lucky MK II condenser-type, 35mm-2¼"x3¼", w/standard lens & special lens, carrier for 16mm, $25. Box 2004. A

Corvair Monza coupe, 1965, auto. trans., all extras, new tires, $2095. Newbury Pk., 805-498-2529. A

Chair & couch set, Naugahyde, champagne biege, $150. Fullerton, LA 5-9633. A

MGA, 1958, convt., r/h, custom top, tonneau & paint, $975. L.A., 398-1458. A

Mobile Home, 2-bdrm., 12'x60', 50' awning, carport, skirts, redwood shed, furn. or unfurn., 2-yrs.-old, take over $92.50 mo. pymts., $1800. Torrance, 370-4101. A

Camper, 8½' Romer, full cabover w/jacks & other access., sleeps 4, $850. Hawthorne, 675-2329. A

SSB Transmitter, Health HX-10, never used, w/Hallicrafters SX-71 receiver & Mosley vest pocket, 20 meter beam, $300. Miraleste, 831-5407. A

Secretary desk, blonde, 3-drwr., pull down board for writing space, $5. Torrance, 327-3344. A

Plymouth, 1959, 6-cyl. stick, $258. FR 5-5760. A

Lot, Holly sect., Green Hills Memorial Pk., $300. Lakewood, 429-6843. A

Tape Recorder, Revere, 2-yrs.-old, takes 2" tapes, $60. Redondo Bch., 379-9278. A

Volkswagen, 1200, 1962, radio, w/w, new paint, $1250. L.A., 472-5284. A

Engagement Ring, diamond, ½-carat w/ matching wedding band, white gold, $175. El Segundo, EA 2-5930. A

Ford Victoria, 1953, auto., p/s, r/h, $125. Garden Grove, 537-5896. A

Chevrolet, 1953, Powerglide, r/h, $150. Torrance, 679-8374. A

For Sale

Bicycle, 24" Schwinn, girl's, 6-yrs.-old, $5. P.V. Ests., 678-6655. A

Surfboard, Bragg, 8'11" 22-lb. wt., 3½ thick, redwood strip, $65. Hermosa Bch., 372-6755. A

Hillman Minx, 1958, 4-dr. sedan, r/h, 35,000 act. miles, 1-owner, $200. Redondo Bch., 375-8132. A

Toy Poodle, AKC reg., papers & shots, black male, $50. Compton, 632-4978. A

Piano, baby grand, $425. Gardena, DA 4-8042.

Sewing Machine, portable, Montgomery Ward, used very little, $25. Long Bch., GA 3-1363.

House, 3-bdrm., 10 minutes from Northrop, den w/bar, 1¾ baths, outside rumpus room, pool-size yard, $29,900. Inglewood, PL 4-6079. A

Bicycle, girl's Schwinn, 24", $20. Inglewood, OS 5-6721. A

Volkswagen, 1200 sedan, 1965, many extras, 8,000 miles, $1700. L.A., 474-9790. A

Mercury Marc 55 w/controls & extra prop., $85. Box 2005. A

Wonder Horse, large, $5. Lennox, OR 2-2370.

Corvair Monza, 1961, low mileage, 4 sep. carbs., 4-spd., transistor ignition, radio, $845. Inglewood, 759-8920. A

Vauxhall, 1960, overhauled recently, $325. L.A., 645-8611. A

Coffee Table, built-in chessboard w/built-in drwr. for storage, teak & birch, $450. Manhattan Bch., FR 4-8236. A

Chevrolet, 1957, 2-dr. h/top convt., 301 eng., dual quads, 3-spd. floor shift, many extras, $700. Hawthorne, OS 5-7049. A

Tires, 2, 7.10x15 w/s/w, tube-type, $8. Gardena, DA 4-8853. A

Wanted to Buy

Lumber, reasonably priced, used, 2x4's, for son's home clubhouse building project. Hawthorne, 676-4536. B

Pup, Boston terrier, male w/out papers, & young Chihuahua female w/out papers, reasonable prices. Gardena, 329-9484. B

Butane Tank, oblong, 3-gal. Torrance, 323-9586. B

Rototiller w/or without attachments. Box 2006. B

Rentals Offered

Bachelor Apt., furn., light cooking, lge. closets, full bath, utilities pd., walk to Northrop, $70. Hawthorne, OS 5-3792. E

Apt., walking distance of Northrop, 2-bath, closed garage, $125 mo. Hawthorne, 676-9620. E

Studio Apt., 3-bdrm., 2 bath, unfurn., closed garage, pvt. patio, hot water & trash paid. Near schools & transportation, $175 mo. Torrance, FR 5-0867. E

House, 2-bdrm., fenced yard, gardener & water paid, $125 mo. Inglewood, OS 6-2162.

Share 2-bath, modern house w/2 working girls, Inglewood area, $60 ea. L.A., AX 2-6909. E

Apt., 1-bdrm., furn., closed gar., sound proofed, 10 mins. to Nortronics P.V., $100-$110. Torrance, 375-9397. E

Apt., 1-bdrm., water & trash paid, 1 block from Northrop, $92.50. Hawthorne, 676-1678.

House, furn., 2-bdrm., dble. gar., 4 blks to beach, $125 mo. Gardena, DA 4-7688. E

Apt., 1-bdrm., stove, refrigerator, ocean view & yard, $78. Redondo Bch., 372-8401. E

House, newly redecorated, 3 bdrm., 2 baths, unfurn., $140 mo. Newbury Pk., 805-498-3331.

Apt., 2-bdrm., 2 blocks from Plant One, free laundry facilities, furn., no small children, $150. Hawthorne, OS 9-7123. E

Apt., furn., 1-bdrm., ground floor, 1 block from beach, gar., $110. Torrance, 376-6137.

Apt., 2-bdrm., unfurn., water paid, gas for hot water paid, $110 mo. Redondo Bch., FR 9-9786. E

Apt., 1-bdrm., deluxe, built-ins, pool, $95 mo. Redondo Bch., 376-2117. E

Apt., 3-bdrm., unfurn., water & trash pick-up paid, closed garage, children OK, 12 mins. from Northrop, $135 mo. Redondo Bch., 370-7550. E

Cabins, Idyllwild, sleeps 6, fireplace, creek, $60 wk., $25 weekend. L.A., PL 4-5288. E

Apt., furn., 1-bdrm., convt. den, 2 baths, facilities, adults, $155. mo. Torrance, FR 5-5372. E

Bachelor Apt., furn., sep. bldg., walnut paneling, garden view, utilities paid, walk to beach, $100 mo. Hermosa Bch., FR 6-1636. E

House, unfurn., 3-bdrm., 1¾ baths, gar., fenced yard, near shopping, water paid, $130 mo. L.A., PL 4-1964. E

Apt., 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

Child Care Offered

Child Care, 5 days a wk., lunch furn., $15 wk. Hawthorne, OS 5-9730. G

Personals

The sympathy & kindness extended to me in the recent loss of my mother was greatly appreciated. MARY NEIMEYER. L

Personals

Surfboard dings repaired by skilled craftsmen. Lynwood, 632-0642. L

Thank You sincerely for your kindness, flowers & expressions of sympathy when my mother recently passed away. Special thanks to all my friends in Production Planning for their solicitude. RANDY WALKER. L

I would like to thank those in the Computer System section, Nortronics, who expressed their sympathy at a time when it was deeply appreciated. WARREN HALL. L

For Sale or Trade

Chrysler, 1956, r/h, auto. trans., p/b, needs rings, $200 or trade for photographic or tape recorder equipment. Torrance, 371-8701.

Honda 250, Scrambler, $600 or trade for auto. Placentia, 528-2783. M

House, 4-bdrm., 2½ bath, fireplace, family room, sundeck, 2 yrs. old, $32,500 or trade for smaller 3-bdrm. home in South Bay Area. Redondo Bch., 370-9135. M

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:20 a.m.—4:05 p.m.

Prairie & 182nd, Torrance. Jane A. Grinnell, Mariposa, ext. 4035, 323-4209. 10

7:30 a.m.—4:15 p.m.

Marine & Highland Ave., Manhattan Beach. L. Berg, Norair, ext. 2763, 379-6762. 3

8 a.m. — 4:45 p.m.

Del Amo & Orange, Long Beach. W. H. Covert, NSL, ext. 2721, GA 3-1363. 5

Rides Offered

8 a.m. — 4:45 p.m.

Del Amo & Orange, Long Beach. W. H. Covert, NSL, ext. 2721, GA 3-1363. 15

ACHIEVEMENT: Another Year Of Business Gets Under Way

(Continued from page 2)

visers are Hank De Bry, management, Dave Bean, sales, and Oliver Larsen, production. Verse Kraft will market decorative plaques and Christmas wreaths.

Custom-Craft is the firm sponsored by Nortronics Hawthorne that will market a serving tray. Its officers are Richard Newman, president, Janet Watters, treasurer, and Wilma Jussen, secretary. Advisers are Art Johnson, management, Harry Colgate, production, and Neal McKinzie, sales. Bob Sheetz serves as alternate adviser.

At Nortronics Anaheim the firm sponsored is called Trivco and will market a trivet and coaster set. Its officers are John Brown, president, Katie Heinz, treasurer, and Bette Peycke, secretary. Advisers are Cy Seeley, management, Leo Gross, production, and Adie Weishaar, sales. Alternates are Dave Harvey and Ira Coleman.

At Northrop Ventura the firm is called Conaco and plans to market initially a Christmas wreath. Officers are Tom Wilds, president, Jamie Strum, treasurer, and Ronalee Craig, secretary. Advisers are W. B. Knox, management, Richard Johnston, production, and Douglas Finch, sales.

Each Northrop division has at least one man who serves to coordinate Junior Achievement work. Bill Burch fills this post at Nortronics; Rollie Pontious at Norair; and Dick Davis at Ventura.

Last year the Ventura-sponsored firm was judged fourth among 182 Southern California JA firms and among the top 15 companies of 786 participating in 12 western states and two Canadian provinces.

Typical of Northrop management endorsement of Junior Achievement is a comment by George F. Douglas, Northrop vice president and general manager at Ventura, who said:

"We are most happy to continue our sponsorship of Junior Achievement. I feel there is no better way for our young people to understand the opportunities, problems and results possible under America's system of free enterprise."

SOME CATS WILL DO ANYTHING FOR RIPE BANANAS

Charlie is a civet cat, a vague relative of the raccoon and the skunk, adopted as a mascot by a Page Communications engineer assigned to a project in Southeast Asia.

Charlie is a hero today and has saved Northrop Page and the United States a great deal of time and money in a project which included running a new cable through an existing, buried four-inch duct between sites of communications equipment.

Faced with the prospect of tearing up the duct, the Page engineer decided to give Charlie a chance first. The engineer tied a piece of twine around Charlie's neck and set him down at the conduit's opening.

He tossed a bunch of bananas into the opening, and away went Charlie. Then the engineer, George Stelljes, clamped a board over the opening.

Now Charlie likes to eat his bananas in the wide open spaces, so he took off for the other end, dragging the twine behind him.

It was a simple matter then of attaching the cable to the twine and pulling it through.

All it cost was a reward for Charlie — a shrimp dinner.

FRINGE BENEFITS

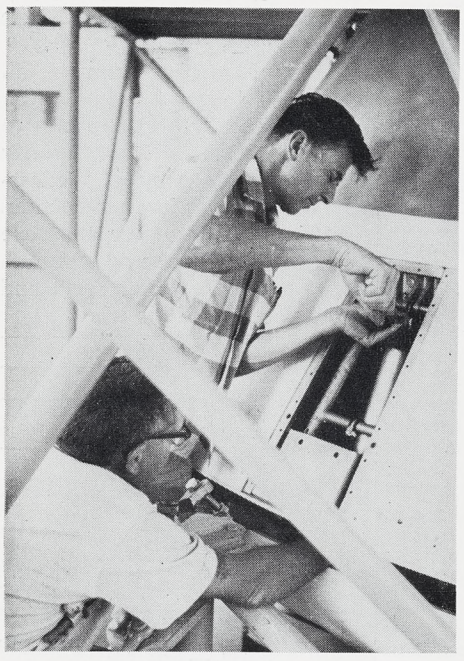
(Continued from page 2)

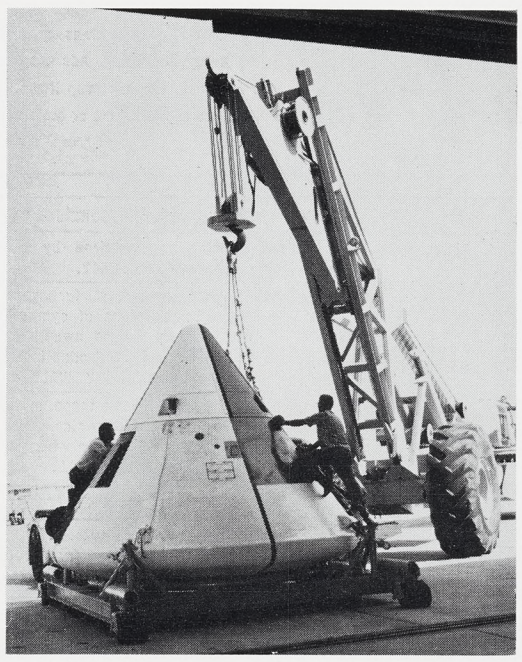
of our earnings above the Social Security base.

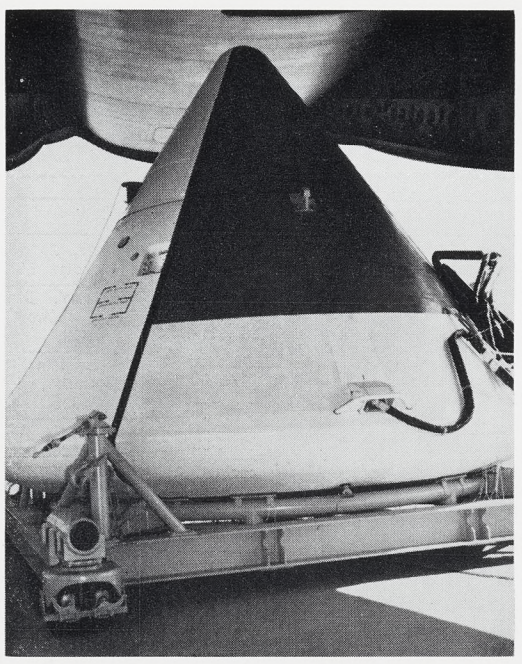
A further item requiring attention is that minimum pensions in many plans have not kept pace with the declining value of the dollar in terms of purchasing power.

Assuming that we get whatever stockholders' and governmental approvals are necessary, Northrop proposes to do something about each of these situations. Some of you may have seen the Proxy Statement for this year's December 14 stockholders' meeting which has just been sent to all stockholders, in which our management requests approval of certain suggested amendments.

The next article of this series will discuss these and previous changes including the "final average benefit", the "retention of the present Social Security base", the "magic 85 early retirement formula", and the "minimum monthly pension".







READYING FOR TEST—After nearly two weeks of preparing a parachute test vehicle for drop at El Centro, last minute tasks such as completing installation of aft heat shield shock attenuation system (left) by C. Tacquard, mechanical crew chief, and L. Lewis, technician, are completed. Boilerplate is taken from Hangar 225 work area (center) to airstrip where C-133 transport plane awaits hookup (right). Rear fuselage doors have been permanently removed for connection of test vehicle. A member of Ventura Field Test Unit rides along as observer, and unit members are responsible for recovery.

Nick Mocerino Named Head of Radome Projects

Nick Mocerino has been appointed project manager in charge of radome programs, it has been announced by M. A. Maurer, vice president and manager, Production Operations department, Northrop Ventura.

Mr. Mocerino, formerly proposal manager, plastics and radomes, reports to John Kerr, director of Product Engineering.

He came to Northrop Ventura in June 1964 after some four years at Aerojet General, Azusa, as project manager on independent and contracted programs in plastics and filament-wound structures for aerospace application. He had been with Zenith Plastics Company for eight years.

Mr. Mocerino entered the aerospace field in 1952, having received his B.S. in mechanical engineering from Newark College of Engineering in New Jersey.

Golfers to Tee Off At Knollwood Club

Northrop Ventura Golf Club will tee off at Knollwood Country Club in Granada Hills Friday, a return contest after their trip to Green Tree Inn on the desert at Victorville October 30.

Known as a tricky course, according to Golf Club Commissioner Ron Morin, Knollwood will offer a challenge to golfers, whether in A, B or C flight competition.

At Green Tree, Andy Andrews was A Flight winner, with Bill Pai dropping from first place at Circle Ranch recently to second behind him.

Ed Steel and Jim Guthrie took trophies for first and second place in B Flight, with Pete Keller and Larry Gosh taking the C Flight honors.

On the distaff side, Julie Berton led with 101 to take the women's trophy.

ELECTION

(Continued from page 1)

pretty solid advisory support from new directors which were also elected this month.

Fred Mickey of Engineering, Jean Ozga of Marketing, Ed Illes of Aero Instrument Department, and Denny Sherwin of Finance join holdovers Bob Iehl of Manufacturing, Fred Weglin of Quality Control and Clyde Corder of Administration on the board of directors.

DROP TEST: Teamwork in the Desert

(Continued from page 1)

Drogue and pilot chutes are packed at the Northrop Ventura main plant in Newbury Park and shipped to El Centro. Control of their availability and other such logistics falls to Jim Middleton and his Facilities Support unit. Mr. Middleton and the men in his unit provide diversified support for the Field Test branch.

They run the tool and supply cribs, maintain blueprint files, transportation, and shipping and receiving. They carry out local purchasing actions and assure the acquisition of materials and equipment from the Ventura main plant. Their responsibility includes obtaining and storing explosive devices used on the recovery system.

Before an Apollo boilerplate is considered ready for a qualification test, Doug Henwood or one of his inspectors checks the detailed flight test plan against the procedures followed to prepare it. Every item must be verified, every piece of hardware signed off.

Each qualification drop is designed to determine the response of the recovery system, in any one of several expected operational conditions.

To establish capsule attitudes that might result from actual mission malfunctions, a brake chute is released by a static line connected to the plane. This initial chute will not ride with the real Apollo. It fulfills its only function during test drops.

The brake chute comes out reefed initially, then expands to its full diameter when pyrotechnic charges fire to cut the reefing lines. Shortly, the brake chute is released from the boilerplate.

The two landing system drogue chute mortars fire seconds later and the drogues deploy, initially reefed, then fully open, to stabilize the boilerplate in normal descent position, aft heat shield down.

As the drogue chutes in turn are released from the boilerplate, three pilot chute mortars fire. The pilot chutes deploy and exert enough force to deploy the three reefed main parachutes.

The main parachute lines become fully extended and cause the pyrotechnic reefing cutters to actuate, permitting the main chute to open fully.

Moments later the boilerplate lands at a final descent velocity of 18 miles per hour.

Bridge Club Boasts Tourney Winners

Playing in an American Contract Bridge League sectional tournament at Oxnard, Northrop Ventura Bridge Club finished three days of competition with multiple honors.

Teamed with a partner from outside the Club, Bob Tracy won first over-all in men's pairs championship. Bob and his wife Tammy captured second over-all in mixed pairs championship, and Ed Cordell and Alicia Thomas joined forces to take fourth in the side game during the second day of the tournament.

The event took place October 22 through 24.

The Northrop Ventura Club members play contract bridge in the cafeteria during lunch hour, five days a week during club championship events and four days a week otherwise.

No championship competition is scheduled in the cafeteria for the rest of the year.

Two Teams Knotted For Bowling Lead

Two teams shared top listing in Northrop Ventura Bowling Club's scratch league during their seventh week, but not the same two as during the previous week of play.

Tied up with 15 games each, Teams 9 and 5 lead the pack. Team 7 fell to second place with 14 wins, 7 losses.

High team series went to Team 5 with 2102, and Team 8 took high game with 738.

Independent high series was all Chuck Taylor's, with a 568, and Clarence Mapes' 220 was good for high game honors. Chuck is a substitute bowler in the league and Clarence plays with Team 5.

Flight Tests Under Way For ALOTS

A team of seven Northrop engineers has accompanied the first ALOTS to the Air Force Eastern Test Range for its final acceptance tests following delivery ceremonies at Ontario Airport.

ALOTS, or Airborne Lightweight Optical Tracking System, was flown to Patrick Air Force Base installed on the Lockheed KC-135 from which it will operate during missile launches.

In a preliminary display of the system at Ontario Airport, California, last Wednesday some 100 military and industrial officials learned details of its operation.

In attendance was USAF Major General Horace Hanes, commander of the Ninth Aerospace Defense Division, Air Defense Command.

Representatives of the Western Test Range, Space Systems Division, Ballistic Systems Division, and Strategic Air Command, from headquarters in Omaha, Nebraska, also inspected the initial airborne optical tracking system.

Designed to track missiles from high flying aircraft, the airborne tracking system was delivered to the Air Force at Patrick within the last few days. All requirements except actual performance of the entire system had qualified at home, home being Nortronics Research Park, Palos Verdes.

In the final tests, ALOTS will fly on the KC-135 while five miles away a B-57 bears a National Bureau of Standards resolution test chart about three inches square. It is the tracking system's job to photograph clearly the images on this three-inch card from that five mile distance, tracking the B-57 as its relative position varies.

CONTRACT

(Continued from page 1)

problem definition and solution through rigorous operations and system analysis. He also will explore potential applications of the ASCAC system with regard to current and future projected Navy ASW operations.

Working with both technical and administrative requirements, Mr. Ellerbe has cognizance over effective project interface with the various organizations of the customer which are directly and indirectly related to the program.

FIRST TEST IN FEBRUARY

Northrop Again Sponsors NMSC Scholarships

Northrop Corporation will again sponsor college scholarships for the sons and daughters of employees through its participation in the National Merit Scholarship Corporation program.

Details involving Northrop's continued support of this important program were presented recently by Richard E. Horner, Northrop senior vice president and chairman of the Northrop University Relations Advisory board which administers Northrop participation.

Northrop scholars, selected from eligible sons and daughters, are ultimately chosen by the NMSC on the basis of scholastic aptitude, leadership, and good citizenship as determined by testing and other procedures established by NMSC.

The amount of each scholarship is based upon the individual winner's financial needs in order to attend the college of his or her choice. Unrestricted grants to colleges and universities attended by the winners is also a part of the over-all NMSC program.

All children, natural or legally adopted, of regular employees as well as the children of retired or deceased employees are eligible. All parts of the Corporation, including its offices, divisions, departments, laboratories, and wholly owned subsidiaries, are included in the program.

Eligible students must take the NMSC Qualifying Test when they are second semester juniors. This test is made available by NMSC to high school principals throughout the United States.

Candidates should make test arrangements with their own school principals during the fall semester of their junior year. The next NMSC Qualifying Test is scheduled to be given on February 26 or March 1, 1966.

This test does not require special study or preparation and is based primarily upon an understanding of, and the ability to use, what is learned, rather than on sheer knowledge of facts.

Semi-finalists are selected and asked to take another examination.

High scoring candidates will be told in January or February of the senior year that they have become finalists as a result of their test performance. They will be required to supply additional information.

Professional evaluation by an impartial committee of educators will determine winners. In most cases, winners will be notified of their awards by April 1 of their senior year.

Each scholarship is a four-year award, called a stipend. It will be based on the family financial circumstances and the cost of attending the college selected. Northrop scholarships will vary between $250 (minimum amount in cases when no financial help is necessary) to the upper limit of $1500 each year.

Each candidate is completely responsible for making arrangements with the accredited college or university of his choice, and for fulfilling its entrance requirements.

Lee R. Thornton, Northrop Space Laboratories, ext. 754, is executive secretary of the Northrop University Relations Advisory board.

NORTHROP NEWS

NORTHROP VENTURA

Published biweekly by Northrop Corporation, Beverly Hills, California — Vol. 23, No. 21 — December 8, 1965

RNAF Stock Purchased for $2.32 Million

Confidence in the sustained growth of overseas industry was expressed again last month by Northrop when the company purchased 3600 common shares and 16 preference shares of the Royal Netherlands Aircraft Factories (Fokker) for $2,320,000.

The stock, which represents 20 percent of the common shares and 32 percent of the preference shares, was purchased from the RAC Corporation, formerly Republic Aviation Corporation.

Headquartered in Amsterdam, Royal Netherlands Aircraft Factories (RNAF) manufactures the F-27 twin engine commercial airline and military transport aircraft. RNAF is main contractor in an international production program for F-104G Starfighters and is participating with Belgium, German, and French firms in development and production of a maritime patrol aircraft.

The company also manufactures plastic aircraft parts, radomes, radar antennas, sailing yachts and other industrial products.

RNAF has participated in preliminary activities on a satellite program under the auspices of Euro Space Technology Center, and the company has developed and manufactured numerous machine tools for the aircraft industry.

In announcing the purchase, Northrop President and Chairman Thomas V. Jones said the shares were obtained as "an investment in a leading aircraft company occupying a strong position in the European Common Market."

Previous overseas investments of major significance by Northrop include purchase of 25 percent of Construcciones Aeronauticas, S.A. (CASA) in Spain. Northrop has signed a license agreement with CASA for production of F-5's for the Spanish Air Force, and a $62 million contract for 70 fighters has been awarded CASA by the Spanish Air Ministry.

SEAMS LIKE FUN

Delegation of young ladies from Ventura School for Girls visited Northrop Ventura recently after indicating interest in careers in garment industry. Three instructors and a dozen girls were briefed by Ted Szostek, general supervisor of the Paralab, and were shown cutting and sewing operations required for parachute landing systems produced at Ventura Division. Girls have been training with sewing machines at the school, which is administered by the Department of Youth Authority, State of California.

Study of Apollo Pallet Awarded NSL by NASA

Northrop is one of four companies selected to perform four-month design studies on the experiments pallet to fly aboard Project Apollo missions, it was announced last month by the National Aeronautics and Space Administration.

C. B. (Con) Harley, base administrator for Northrop Ventura at the El Centro field test facility has been appointed field manager for the NSL program. Mr. Harley has been responsible for field tests of the Apollo Earth Landing System, developed by Northrop Ventura.

Succeeding Mr. Harley as administrator of the El Centro Field Test branch is O. S. Reed, who served as a supervisor under Mr. Harley.

Studies will be performed by Northrop Space Laboratories, Lockheed Missile and Space Company, McDonnell Aircraft Corporation, and the Martin Company.

Working under separate $375,-

(See PALLET, page 6)

Broader View of Aerospace Industry Urged by T.V. Jones

Northrop President and Chairman Thomas V. Jones told Southland business leaders November 17 that the aerospace industry was no longer a boom-or-bust business and should be viewed in much broader terms than just defense.

"The industry that we call aerospace embraces the entire space program, airline transport —both passenger and cargo. It includes to an increasing extent sea transport, both surface and undersea. It includes very important segments of the vast communications industry.

"You will find in it important activities dealing with the exploration of undersea space, desalination of water, automatic test equipment, special purpose computers, and a wide variety of other contributions to our dynamic industrial society," Mr. Jones said.

"Indeed, when you look at the capability of our industry . . . it should more properly be known as an advanced technology industry and its future potential goes far beyond the needs of the defense program."

Mr. Jones spoke on behalf of the aerospace industry at a day-long conference of the 17th annual Business Outlook conference sponsored by the Los Angeles Chamber of Commerce. More than 700 businessmen attended the conference which heard such speakers as Lynn A. Townsend, president of Chrysler Corporation, and Albert T. Sommers, vice president and director of economic research for the National Industrial Conference Board.

As for defense, Mr. Jones said it is about time that thoughtful people recognized that there have been deep and meaningful changes which should by now have dispelled the boom-or-bust image.

The old policy and practice was to work feverishly in time

(See OUTLOOK, page 6)

December Is Busiest in ELS History

Spacecraft landing systems developed by Northrop Ventura are scheduled, during the month of December, to undergo their most intensive series of operations since beginning of the U.S. manned space program seven years ago.

If all goes well with flight plans announced by the National Aeronautics and Space Administration, two manned Gemini launches from Cape Kennedy and a major test of the Apollo earth landing system at White Sands Missile Range, New Mexico, will occur within a span of less than 20 days.

The three parachute landings, involving Northrop Ventura staffs on both the Gemini and Apollo programs, could occur within two or three days of each other.

First on the schedule was the December 4 launch of Gemini 7. Astronauts Frank Borman and James A. Lovell, Gemini 7's crew, have as their main objective a two-week stay in earth orbit.

A few days later, while Borman and Lovell are still aloft, the last in a series of six Apollo escape and landing system tests will be conducted at the White

(See SPACE, page 6)

Service Awards Go to 11 Veterans; 20 Years for Lind

Eleven more Northrop Venturans received service pins last month for having completed 20, 15 and 10 years of service.

Mr. Lind

John Lind, Material Control scheduler, reached the twentieth anniversary of his Northrop service on November 26.

When he first joined Northrop, Mr. Lind served as a tool planner at Norair. Currently he is in charge of production operations project schedules for drones, including the AQM-38A (RP-76), MQM-57B (SD-1), MQM-36A (KD2R-5), subcontracts, Norair T-38/F-5 seats, inverted flight tanks, and miscellaneous plastic parts.

As a tooling planner back in 1945, his work dealt with the Flying Wing.

A member of the Air Force Association Big Bear Valley Sportsmen Club and the National Rifle Association, Mr. Lind holds a gold medal as expert with a light rifle. He is also a sharpshooter with a .22 semi-automatic pistol.

Harold Bixby received his 15-year pin during November, and the following people have completed 10 years: Inga Frostek, William McDonnell, Wray Hambrick, Louie Raiola, Garrett Bruen, Delio Piantino, Carole Harrison, Hillis Wiley, and Lila Hamelau.

IT'S 1000 PAGES FOR APOLLO ELS

You Can't Tell Hardware Without a Scorecard

A typical Earth Landing System for Project Apollo will generate more than 1000 pages of supporting documentation which must necessarily accompany all hardware shipped from Northrop Ventura.

Mr. Kleinman

If you think this is tough on the Contract Documentation people who are responsible for assembling the data package, think what it would be like for the customer to open an unknown package and integrate it into a lunar mission with no background information or instructions.

According to the head of Proposals and Contract Documentation, Jim Kleinman, the amount of paper seems fantastic in size, but when considering the hours of effort that these few thousand pages represent, the paperwork takes on a new light. Mr. Kleinman explained that a good example of the paperwork being produced to support one ELS delivery would be a Data Package.

Compiling a data package is a continuous job, because it has to be ready to go at the same time as the hardware, and the hardware can't go without it.

Seven departments at Northrop Ventura provide information in 17 categories. But it falls to Tom Miller of the Data Package portion of Contract Documentation to audit and compile the maze of documentation being received from the time the hardware starts into production until the day the finished hardware is shipped.

Tom's simple task involves from hand certifying the serialization/identification for each of thousands of required pages, to tactfully seeing that all input is on schedule, readable, and collated.

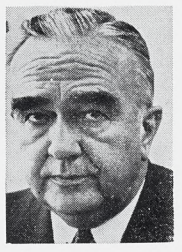
What goes into a data package? There's Acceptance Test Procedure / Orders, Acceptance Test Data, Operating Time Data, Configuration-Serialization Data, Replacement Record Data, Failure and Malfunction Data, Corrective Action Data, MRB Action Data, Preservation and Storage Data, Special Handling Instructions, NV-Government Shipping Orders, List of Drawings Required, Instrumentation Calibration Sheets, Certificates of Conformance, Waiver and Deviation Records, Weight and Balance Records and Instrumentation Calibration Data Sheets.

"Gathering all this information within a prescribed time is the biggest problem of all," Mr. Miller says. Data Packages cover everything from subassembly installation through shipment, divided

(See DATA PACKAGE, page 6)

FRINGE BENEFITS

Improved Retirement Plans Await Confirmation

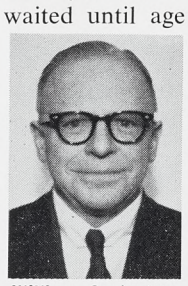


By WILLIAM LARRABEE
Vice President—Industrial Relations

The November 17 article in this series pointed up some changes which your management contemplates in our Retirement Plans, assuming appropriate stockholder and governmental approvals. Each of these changes is part of a total package designed to improve retirement benefits for eligible people retiring under the two primary Northrop Plans after the changes become effective. Detailed amendments will be available when they are approved and will be controlling, of course, but in the meantime, some general explanations might be helpful.

Let us talk first about early retirement. Under the Plans as they now stand, a person age 55 or over with a minimum of 10 years of continuous service can retire early and begin drawing retirement pay at once. As a practical matter, however, very few people do so because the amount which they receive is cut back so heavily through reduction based on actuarial tables.

As an example, let us assume that Mr. "A" wants to retire at age 55 by reason of health or other personal considerations which would make it necessary for him to leave the company. Let us also assume that up to that point he has "earned benefits" which would pay him $100 a month if he retired and waited until age 65 to start the payments. If Mr. "A" retires early and starts his payments at age 55, he will get only about $45 a month instead of $100 because of the actuarial reductions. This is understandable because the pension has to be paid for 10 more years than would have been the case if he waited until age 65 to start payments.



William Covington
Corporate administrator
Retirement Plans

In order to help people in this situation, your management plans to adopt what has become known as the "Magic 85" formula coupled with a "two and one-half percent flat reduction" instead of an "actuarial reduction." In order to understand how this works, let us take our same Mr. "A" who had the earned benefit of $100 and who is age 55 with at least 10 continuous years of service. If Mr. "A" had 30 years of continuous service, his age (55) plus his service (30) would equal 85 and he could retire early under the "Magic 85" with his full earned benefit of $100 a month when he retires.

If he had 25 years of continuous service, his age (55) plus his length of service (25) would give him 80 points. He could then retire with his $100 a month less two and one-half percent for each point which he is short of 85. Since he is short 5 points, he would get his $100 less 12½ percent, or $87.50. In short, under the "Magic 85" formula, a person eligible for early retirement adds his age to his length of continuous service, and if the result falls short of 85 he can tell exactly how much his earned benefit will be reduced by multiplying the difference by two and one-half percent.

That is not all of the story. There are some people in the age 55 to 65 group who will not have accumulated nearly 85 points but who will have satisfied all other requirements for early retirement. Let us assume that Mr. "B" wants to retire at age 60 but has only 10 years of continuous service. Since age 60 plus 10 years service gives him only 70 points, the "Magic 85" does not help him. He can turn, however, to the "two and one-half percent flat reduction".

Under this formula, our Mr. "B" can nonetheless retire early at a flat reduction of two and one-half percent for each year that his age falls short of 65. Since Mr. "B" is 60, his $100 a month will be reduced by 12½ percent to $87.50 a month compared with $65 per month he would get now. It can be readily seen, therefore, that every early retiree stands to gain over the present plan. The biggest reduction that the early retiree can take from his earned benefits is 25 percent, and if he has enough points under the "Magic 85" formula, he will take no reduction at all.

One thing should be made clear before we leave this phase of the program. Some people are under the impression that if they retire early with 85 points they would get the same amount of pension as they would have received if they worked through to age 65. This is not correct. The early retirement benefit continues to be calculated on the benefits earned before the date of early retirement. If he continues to work he will, of course, build up more earned retirement benefits each year as his working life continues until he reaches normal retirement age.

So much for early retirement. Let us now look at the complicated problem which arises by reason of the change effective January 1, 1966 in the Federal Social Security base. In common with many plans, Northrop's retirement benefits are computed in part upon a percentage of the compensation which each of us earns over and above the Social Security base established by the Federal Government.

At the present time Northrop and its people are taxed on the first $4800 of the employee's earnings each year for Social Security. $4800 is thus the present Social Security base. As of next January 1, the new law will increase this base to $6600. Thus, as the base increases, the amount which the employee receives as a percentage over the base decreases. Northrop wishes to continue to use the $4800 figure for its pension computation purposes in order to prevent any reduction in the rate of accrual of benefits in future years.

The remaining changes are of great importance to our hourly-paid personnel and, in combination, represent a Northrop "first" in our industry. The first of these has to do with minimum pensions. Briefly, our present Hourly Plan provides a minimum retirement benefit of $2.50 per month per year of service, with a maximum of 30 years for accumulation of this benefit. The revision increases the minimum pension for people becoming eligible after the effective date to $3.75 per month per year of service, and increases the maximum period to 35 years.

In combination with this and in recognition of the contributions which its people of long service have made to the company, our management plans to install what is called the "final average" computation in its Hourly Retirement Plan as it has already done in its Salaried Plan. This means, in substance, that an eligible person's pension will be based upon the average base amount which he has earned for his best five continuous years out of the last 10 years of employment, instead of on his actual base earnings back to the inception of the Plan.

All of us who have been around for a while can recall that wages generally are a good deal higher now than they used to be. This change, therefore, cannot help but benefit Northrop people. There is one more important aspect to the change. Northrop believes that people deserve to be treated as individuals and that individual initiative in working toward better and higher paid jobs should be recognized. Hence, if a man has a reasonable minimum pension and is left free through "final averaging" to better his retirement through earning better wages and promotions, he has the satisfaction of seeing his efforts rewarded.

As was stated initially, all of this planning is subject to various approvals. We are hoping for effective dates of February 1, 1966, but at the proper time detailed announcements will be made, including effective dates, eligibility, and other pertinent factors.

There is one more issue of the NORTHROP NEWS before our Yearend Holiday. Perhaps that would be a good time to talk in the spirit of Christmas about some of the nice things which we Northrop people do for others, not only at Christmas time but throughout the year. When we get back to work again, we can then discuss more of our fringe benefits and some additional things that are going to happen in this area.

FREEWAY ROUTE SELECTED BY STATE WILL UPSET WORK

The California State Highway Commission has selected a route adjacent to Nortronics Hawthorne for the portion of the Century Freeway known as Freeway Route 42.

Commenting on this decision as it affects Northrop Corporation, George Gore, Corporate vice president, general counsel and secretary, said: "the location of the freeway along the route selected will place it so close to the company's facility at Van Ness Avenue and 120th Street that vibrations emanating from the freeway will disturb the work performed on delicate instruments in the facility and could cause the company to incur very substantial costs — perhaps as much as $1 million—to relocate the work."

Representing Northrop at a recent State Highway Commission hearing, Robert B. Watts, jr., assistant general counsel, had reported that the freeway path since selected would interfere with the work because it would pass within 140 feet of the Nortronics building.

The route adopted by the Highway Commission runs eastward from Sepulveda, then turns southeast before crossing Hawthorne Boulevard. From this point it runs adjacent to the Hawthorne Municipal Airport and the Northrop property until reaching the area of Western Avenue, then jogs northward again.

In addition to interfering with work in the Nortronics building, the route would absorb a small portion of the Nortronics property at its northwest corner for an on-ramp.

Alternative paths for the freeway section would have followed closer to Century Boulevard, away from the Northrop property.

25 YEARS

George Gore (left), general counsel and Corporate secretary, receives his 25-year pin from Northrop President and Chairman Thomas V. Jones during recent Beverly Hills ceremony. Mr. Gore joined Northrop in 1940 as its resident legal counsel. He was elected secretary in 1945. He was appointed to his present position in January of this year.

1st Quarter Sales Hit $70.4 Million

Northrop consolidated sales totalled $70,439,000 for the three months' period ended October 24, 1965, Thomas V. Jones, president and chairman, announced recently. Consolidated net income for the quarter totalled $1,691,000, equivalent to approximately 41 cents per share on the 4,160,636 shares outstanding.

In the first quarter of the prior fiscal year, Northrop had $72,433,000 in consolidated sales and consolidated net income of $2,007,000, equivalent to 49 cents per share on the 4,092,739 shares outstanding a year earlier.

The company's sales backlog at October 24 totalled approximately $285,000,000, compared with approximately $288,000,000 three months earlier.

The backlog still does not include approximately $100,000,000 of contracts already in work which have not been finally negotiated, according to Mr. Jones.

MORRIS SCHECHTER NAMED HEAD OF SAFETY PROGRAM BY PYTHIANS

Young drivers who are just getting ready to plunge into the freeway maelstrom for the first time are the object of a highway safety and courtesy program headed in California by Northrop Ventura's Morris Schechter.

Mr. Schechter

The program is actually nationwide, sponsored by the Knights of Pythias, a fraternal society founded in 1864. Mr. Schechter, a past chancellor of the Woodland Hills Centennial Lodge 408 of the society, has been appointed state chairman.

The program consists of a poster contest open to all students in junior and senior high schools in the United States and Canada, who will be competing for more than $1000 in prizes. Awards will be made on state and national levels.

"We wish to emphasize that learning to drive is more than knowing how to shift gears," Mr. Schechter said this week. "Our private study of police records of accidents reveal that most accidents could have been avoided if drivers had merely observed 'the rules of the road.'"

In line with the program purpose to promote safety thinking by students and the means by which accidents can be prevented, the poster message must reflect the causes and/or prevention of highway accidents.

Mr. Schechter, an air conditioning mechanic on the third shift, encourages parents of interested students to obtain copies of the contest rules by writing him at 14955 Dickens Avenue, Sherman Oaks.

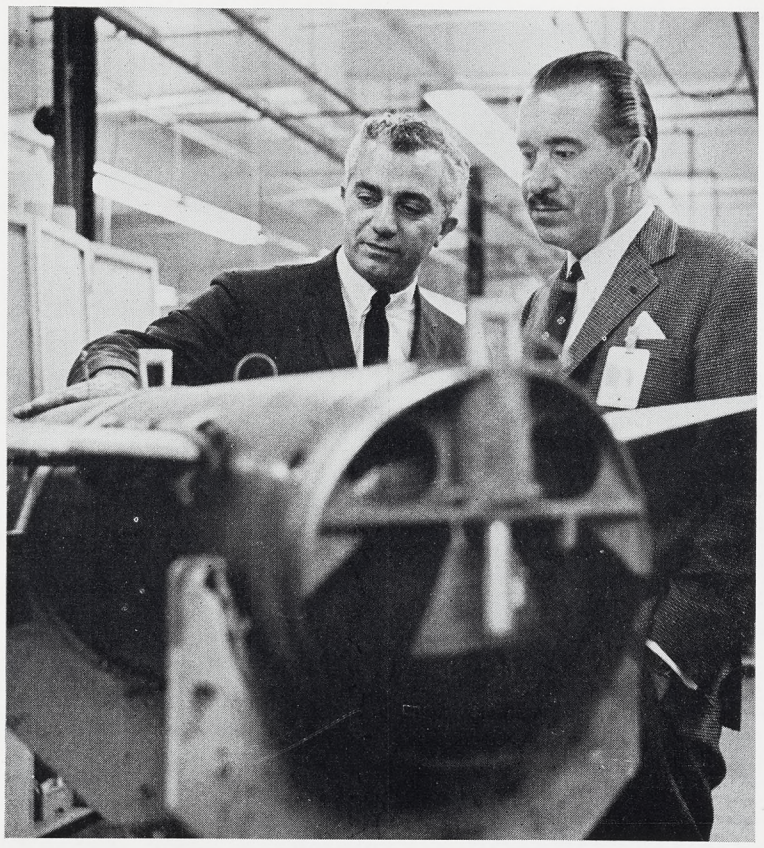
Two fellow Northrop employees—Paul Friedman, 6163 White Oak Avenue, Reseda, and Ray B. Bourland, 6302 Caroline Avenue, Simi—are also equipped to answer inquiries. Contest rules also have been posted on all safety bulletin boards at Northrop Ventura.

Posters submitted in the local contest will be displayed in the Northrop Ventura cafeteria until time for judging.

The program is being supported by driver education instructors throughout the Los Angeles County area school systems, Mr. Schechter said, as well as news and radio media.

The local contest closes December 31, and winners will be eligible for the national contest to be held in June 1966.

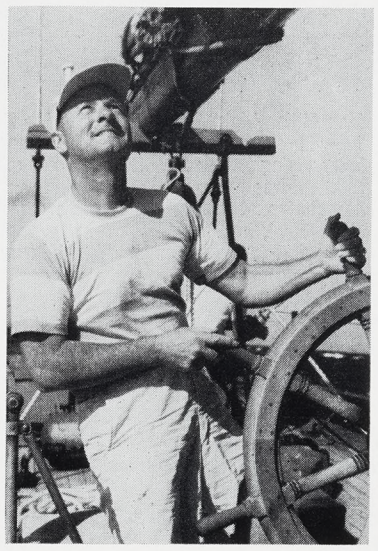
THE WELCOME MAT

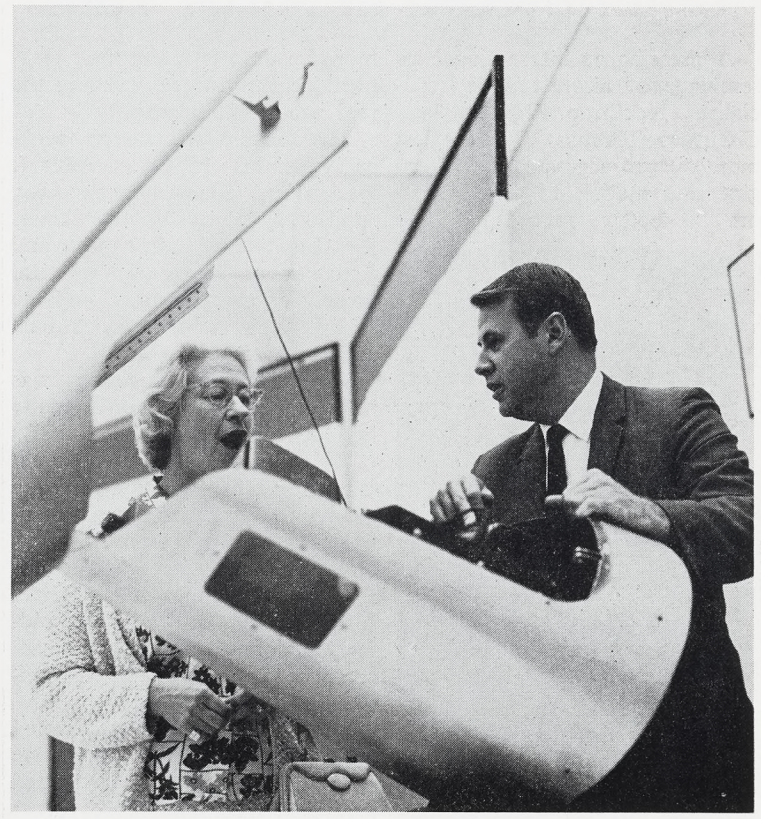


A. P. Buchiarelli (left), senior Marketing representative with Northrop International, conducts tour of Northrop Ventura drone manufacturing facilities for Adolf Galland, Northrop Corporation consultant in Germany. A retired general officer, General Galland was promoted to lieutenant general at age 29, becoming the youngest three-star general in the German Air Force. In photo below, three executives from SINTRA, electronics company in Paris, are briefed on Northrop Nortronics capabilities by R. E. Ringle (left), Marketing representative, at Palos Verdes. The executives (right to left) are George Granjon, Louis Chambeau, and Pierre Abraham. The visitors were briefed at Nortronics Anaheim as well and were especially interested in automatic checkout equipment, microelectronic applications and computers and display systems.

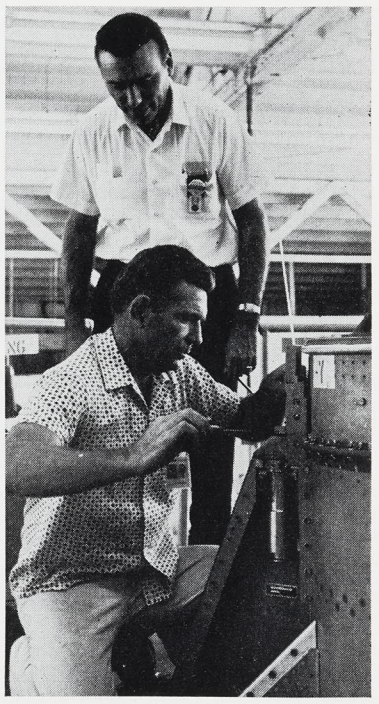
Fortnight in Review

Mrs. Eleanor Willard (at right) who participated in Business-Industry-Education Day at Northrop Norair recently is agog at reconnaissance nose developed for F-5. Fritz Probst of Customer Relations is the demonstrator. In another kind of demonstration, Pete Vogel (below), advertising manager at Northrop Architectural Systems, takes the wheel of the schooner Polynesia, one of the largest sailing ships in the world, during a 10-day Bahamas cruise. The vacationing Mr. Vogel was a paying "crew member" in a unique arrangement which allows amateur seafarers to test their nautical skills.



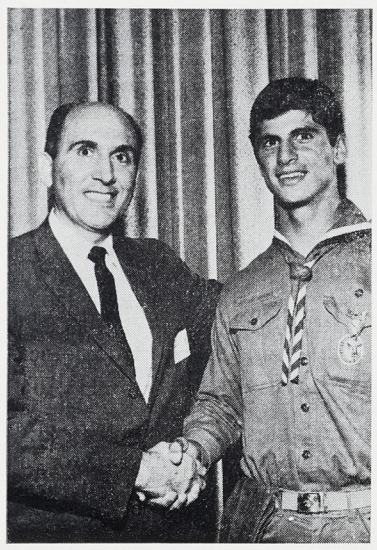


EAGLES AND FRIENDS



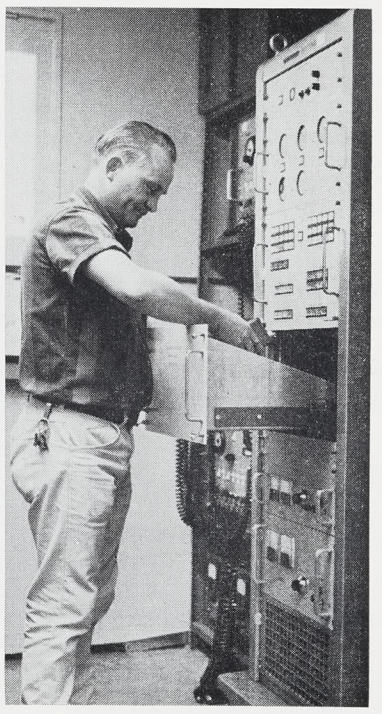
With fifth in a series of tests of Apollo emergency escape system scheduled this month at White Sands, New Mexico, combined with continuing drop tests of parachute landing system, activity at Northrop Ventura's El Centro Field Test Unit facility has been accelerated considerably. As is done before each Apollo test, Ralph Voorhees prepares apex cover ejection system (above) while North American engineer, Hal Neuman, observes. Clay Robinson, electrical crew chief, tests automatic sequence controller (below).

Elmer Noonan, Northrop Nortronics director of Industrial Relations, congratulates Eagle Scout Robert G. Alleman (photo above) and Johannes S. Newton, Northrop Norair senior technical specialist, gives a pat on the back to Lee A. Morris (below) at recent recognition dinner for youngsters who have attained scoutdom's highest rank. Mr. Noonan and Mr. Newton were among 500 industry representatives who served as host for new Eagles.



HL-10 TAKES TO "AIR"

Northrop Norair technicians handle guide lines as HL-10 lifting body research vehicle is removed for its assembly fixture. Vehicle, second of its type built by Norair for National Aeronautics and Space Administration, is currently going through final stages of assembly. It is scheduled for mid-January delivery. Meanwhile, first vehicle, the M2-F2, is nearing date for its first high altitude manned captive flight at NASA's Flight Research Center, Edwards Air Force Base. Both vehicles will be used by NASA in furthering the art of returning manned vehicles from space.



MEETINGS

Value of Working Models Emphasized in AIAA Talk

Addressing an international assemblage of aircraft design specialists, Northrop President and Chairman Thomas V. Jones last month urged a greater use of engineering models to give inventors "a better opportunity and more freedom to direct their technical genius toward fulfilling the real needs of our society."

Northrop President and Chairman Thomas V. Jones addresses AIAA Aircraft Design and Technology luncheon.

Mr. Jones was luncheon speaker November 16 at an Aircraft Design and Technology meeting, sponsored jointly by the American Institute of Aeronautics and Astronautics, Royal Aeronautical Society of Great Britain, and the Japan Society for Aeronautical and Space Sciences.

The three-day meeting was held at the International Hotel in Los Angeles.

"We may be placing too great a responsibility on analysis as a means for estimating the potential of a new development or its ability to achieve a specified objective," Mr. Jones said. "There is still much value in the old-fashioned method of gaining acceptance by an actual demonstration.

"We have greatly sharpened our tools of analysis and yet we must not let our sophisticated analytical techniques obscure the power that lies in a physical demonstration by a working model."

Heading the U.S. delegation to the international meeting was Northrop Senior Vice President Richard E. Horner, national chairman of the AIAA. Sir Walter Cawood of the Royal Aeronautical Society led the British delegation, and Hiroshi Nakaguchi headed the Japanese group.

More than 100 technical papers were presented, including one on the Northrop F-5 by Welko Gasich, Norair vice president and assistant general manager—Technical.

Darrel L. Hirsch of the Norair Technical Management staff and R. L. McCormick, senior engineer, co-authored a paper on experimental investigation of pilot behavior in a PIO (pilot induced oscillation) situation.

The Management session was chaired by Milt Kuska, Norair deputy assistant general manager-Technical.

Charles W. Eyres, assistant to the vice president and assistant general manager—Technical, was general arrangements chairman for the over-all meeting and was chairman of a special program on the F-111 and C-5 airplanes.

Transport Range Boosted by LFC

A 35 percent gain in range for long-range transport airplanes using laminar flow control on the wing is expected, according to an article by Northrop Norair's Ruediger E. Kosin in the AIAA Journal of Aircraft.

Mr. Kosin, former director of X-21A engineering and now technical assistant to the Norair vice president and assistant general manager-Technical, reported on five years of research by Northrop into application of the laminar flow control (LFC concept, including flight tests of the X-21A, an 80,000 pound jet aircraft designed and built by Northrop).

In comparing LFC with conventional aircraft, Mr. Kosin said the 35 percent gain could be made in range with comparable payload, or a 35 percent gain in payload within comparable ranges.

The most significant feature of LFC wings is rows of tiny slots running spanwise along the upper and lower surfaces. Boundary air is inhaled through slots and expelled to the rear by use of compressors mounted in wing pods. The process prevents buildup of high-drag turbulence and allows a smooth flow of air over wing surfaces.

Data contained in Mr. Kosin's article is based on years of preparatory work in wind tunnel testing and analysis and a flight test program at Edwards Air Force Base using a modified Air Force WB-66D aircraft.

The Aeronautical Systems Division of U.S. Air Force Systems Command is sponsoring organization for the research.

Passenger List Full For Hawaii Tour

Northrop NRC Travel Club this week flashed the "sorry, full" sign for their annual yearend holiday excursion to Hawaii.

Ninety-four travelers have signed up for the tour departing December 24 and returning January 2. Only standby reservations are being accepted through Personnel Activities offices.

MONTHLY MILLION

Approximately $1 million per month is contributed to major health and welfare causes in Southern California through AID-United Givers. In AID's first year of operation, 1951, a total of $1,500,000 was raised for the entire year.

MILLION MILER

Jack Miller (right), executive pilot for Northrop Norair, receives congratulations from Max Stanley, chief of Flight Support Operations, upon receipt of Million-Miler Flying Safety Award. Honor recognized Mr. Miller's having flown 1,119,660 accident-free miles for Northrop and was presented by National Business Aircraft Association at recent Los Angeles meeting. Mr. Miller has flown for Northrop since 1954, has logged 6000 hours without an accident. His total time logged as a pilot is in excess of 15,000 hours.

SMALL BUSINESS CONFERENCE ON SUBCONTRACTING SCHEDULED

Northrop Corporation will participate in the first of a national series of small business conferences on subcontracting December 15 at the Beverly Hilton Hotel.

J. W. Hinchliffe, Corporate director of Materiel and Facilities, will moderate a question and answer panel during the conference. As a member of the Southern California steering committee for the conference, Earl Rossomme, Northrop Norair Small Business liaison officer, is in charge of publicizing the December 15 meeting.

Northrop's role occurs as members of the sponsoring organizations—the Aerospace Industries Association, the Electronics Industries Association, and the National Security Industrial Association.

The Small Business Administration, Department of Defense and National Aeronautics and Space Administration are participating on behalf of the government.

The Strategic Industries Association will offer the subcontractor viewpoint.

The purpose of the conference is to discuss ways and means of assuring greater subcontracting opportunities for small business and to define the procedures necessary to attain awards.

An attendance of more than 1000, representing small business from throughout the Southern California area, is anticipated.

Guest speaker will be the Honorable James C. Corman, Congressman from California, who will be introduced by Major General James Stewart (USAF Res.).

Other U.S. Government legislators have been invited to attend.

Philippines Is Host For Eleventh Asian Logistics Meeting

Four Northrop Norair executives were active participants in the Eleventh Asian MAP Logistics conference held November 10-13 at John Hay Air Base, Baguio, Philippines.

Others attending were: Frank Mathes, manager of Product Support; Richard W. Parks, deputy division manager, F-5 MAP; Donald H. Paap, director, F-5, Product Support (Pacific); and Donald D. Gregor, supervisor, Maintainability Requirements and Analysis branch.

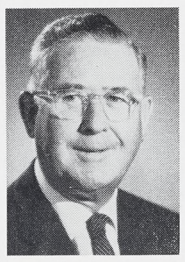
Mr. Mathes and Mr. Gregor made special presentations during the F-5 Component Repair seminar, a part of the conference.

More than 90 persons took part in the affair, including representatives from Air Force Headquarters, Logistic Command, Systems Command, Aeronautical Systems Division, Pacific Air Force, the office of the Commander-in-Chief-Pacific, and MAAG advisors from the Philippines, Republic of Korea, Nationalist China, Vietnam, Laos, Thailand, Burma and Japan.

FIRST PERSONNEL DIRECTOR

Walt Gage, Northrop Pioneer, Dies

A deep feeling of loss was felt at Northrop last month with the passing of Walter T. "Walt" Gage, a Northrop pioneer in every sense of the word and a close personal friend of many employees.



Mr. Gage

Mr. Gage, 73, died November 12. Funeral services were held November 16 at Santa Monica.

Walt Gage joined Northrop Corporation during its organizational phases in 1939. He was Northrop's first Personnel director. In the years following, he was in constant touch with many employees in his supervisory posts in Industrial Relations.

For a brief period he was in Industrial Engineering. Shortly after the formation of the Northrop Credit Union he took over as its secretary-treasurer, a post he filled for 17 years until his death.

Born in October 1892, in Tombstone, Arizona, Mr. Gage became a true aviation pioneer. During World War I he served with the 311th Aero Squadron as a sergeant first class. For nine years prior to joining Northrop, Mr. Gage worked with Douglas Aircraft in Personnel.

Mr. Gage is survived by his widow, Alice, and two sons, Carter and Walter H. Gage.

NORTHROP NEWS

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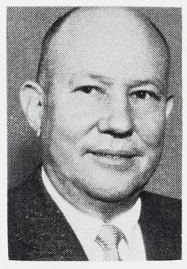
ORDNANCE GROUP ELECTS ALISON TO FOUR YEAR TERM

John R. Alison, vice president —Customer Relations, has been elected to a four-year term as a director of the American Ordnance Association.



Mr. Alison

The Association is a society of American citizens dedicated to industrial preparedness for the defense of the United States.

Mr. Alison, a fighter ace in World War II, is a past president and a past chairman of the board of the Air Force Association.

Prior to joining Northrop in 1953, he was president of the Transit Van Corporation of Redwood City, California, and before that he served as assistant secretary of commerce under Secretaries Harriman and Sawyer.

Northrop Pair Rides On 25,000 Mile Search for Comet

Frank Schroeder and Byron Bolling of Northrop Norair may not be around for the next performance, but they both have vivid memories of participating in what turned out to be one of the most spectacular astronomical shows of all time last month.

They took part in the flying laboratory observations (in the South Pacific) of the elusive comet, Ikeya-Seki.

Their lack of interest in the repeat show stems from the fact that it will be from 500 to 1000 years before the Ikeya-Seki comes back into range for such close observation again.

Under sponsorship of the National Aeronautics and Space Administration, the flying laboratory team of highly qualified scientists observed the comet over the South Pacific. They took photographs, made visual, infrared and spectrographic recordings and gathered wealths of infrared and radiometric data.

Operating out of Honolulu, Hawaii, the laboratory, housed in a specially-outfitted Convair 990 jet transport, made about nine flights, each of an average duration of from five to six hours.

Mr. Schroeder and Mr. Bolling were along to observe aircraft performance as part of a new aircraft maintenance contract Northrop is filling for NASA's Ames Research Center. Mr. Schroeder heads the Northrop staff there, while Mr. Bolling is a Quality Control representative.

"Each of us made a number of the flights and observed the comet when we could find a vacant window or porthole," Mr. Schroeder said. "It was really something to see and hard to describe. It was five times as brilliant as the full moon."

The two Northrop men returned to Ames RC late last month with the team and aircraft crew that had logged something like 25,000 miles in less than two weeks of operations and without a mechanical hitch.

Mr. Schroeder reported another interesting highlight to the trip. The Northrop men watched as a Vietnam-bound squadron of Northrop-built F-5s came in for a stop at Honolulu on one of their touchdowns on the ocean-spanning trip.

To place an ad in the Northrop News, obtain classified ad form C67 from your organization clerk and mail the ad to Northrop News, 170, Beverly Hills.

Classified

Deadline is noon Wednesday, one week before publication. Ads are limited to one item. The Northrop News reserves the right to edit or omit ads.

For Sale

Camera, Argus C-3 w/shade, filters, leather case, $35. Buena Pk., LA 1-4711. A

Vacuum Cleaner, Kenmore, 7-mos-old, still under guarantee, $15. Hawthorne, 679-6917.

Refrigerator, Philco, 12 cu. ft., lge. freezer, auto. defrost, $100. Hawthorne, OS 9-2875. A

Yamaha, 1964 YDS2, 250 cc, semi-custom, $650. Wilmington, 830-1318, 834-4829. A

Corvette, 1963 fastback, r/h, p/windows, 340 hp, 4-spd. trans., $2700. Gardena, DA 9-3469.

Dodge, 1958 9-pass., full power, r/h, $200. Torrance, 320-2827. A

Night Stands, w/built-in radios, $3. ea. or sell sep. Burbank, PO 1-9565. A

Lounge chair, pr., beige textured fabric, foam cushions, button back, on casters, $40. Torrance, 323-6795. A

Bicycle, 26", boy's, w/highrise handlebars, banana seat, $10. Hawthorne, OS 9-4778, 370-9238. A

Dodge Dart, 1962, 4-dr. sedan, p/s, p/b, 38,000 orig. miles, new brakes, $975. Reseda, 987-1352. A

Ford, 1951 custom 4-dr., r/h, good tires, new battery, elec. safety door locks, $125. Redondo Bch., FR 5-3914. A

Bicycle, 20", girl's, $15. Downey, TO 1-6404.

Rambler Classic station wagon, 1963, V-8, auto. trans., w/w tires, r/h, $1495. Torrance, 326-6539. A

Bicycle, boy's 10-spd., Schwinn Continental, $40. Fullerton, LA 6-6759. A

Chevrolet, 1956 station wagon, 327, V-8 eng., 1-owner, new w/s/w Firestone tires, $400. P.V. Ests., 375-3902. A

VW Bumpers, front or rear, comp. w/guard, $12 ea. Huntington Bch., 714-897-8201. A

Buick Century, 1956 2-dr. Holiday coupe, full power, 6-way seats, recent o/haul, Offenhauser valve covers, $750. Hawthorne, OS 5-9500. A

Range, gas, 30" Hardwick, auto. oven pilot & broiler, less than 2 yrs-old, $65. Wilmington, 835-2328. A

Oldsmobile, 1950 4-dr., needs brake work, $50. Anaheim, 714-772-9041. A

Vacuum Cleaner, General Electric, tank-type, attachments incl., $20. Hawthorne, 675-8360.

Transmission, for 1960 Sunbeam, w/overdrive, $35. Compton, NE 5-3294. A

Cabin Cruiser, 17' w/trailer, twin 75 hp engs., 1 completely rebuilt, tachometers, 20-gal. gas tank, many other extras, sleeps 2-3, $2195. Torrance, 375-6634. A

Acreage, lake frontage in No. Calif., 2 2½-acre parcels, easy terms, 2 2½-acre parcels, $5750 par., 2 5-acre parcels, $9500 par. L.A., 476-1635. A

Corvair Spyder, 1964, 4-spd., 20,500 miles, r/h, rear speaker, $1595. L.A., PL 9-5991. A

Chevrolet Impala, 1958 2-dr. h/top, auto., p/s, p/b, w/s/w, r/h, $450. Hawthorne, 675-2953. A

Corvair Monza, 1963, 4-spd., other extras, 41,000 miles, $1245. Lomita, 326-8959. A

Bicycle, girl's, $15. P.V. Pen., FR 8-1863. A

Tape Recorder, Webcor Music Man, stereo, portable, $100. Redondo Bch., FR 2-1375. A

Ford Pickup, 1929 model A, good orig. running con., spare eng., radiator, trans. & various spare parts, $400. Thousand Oaks, 805-495-5531. A

House, 4-bdrm., family rm., 2½ baths, 1 acre, horses OK, near Northrop Ventura, $35,-000. Somis, 805-482-1186. A

Chevrolet, 1953 convt., stick shift & tonneau cover, many extras, $250. Torrance, 327-4585.

Piano, mahogany Wurlitzer spinet, traditional styling, $400. Manhattan Bch., 676-6249. A

Range, O'Keefe & Merritt, gas, w/timer, $40. Gardena, 327-2279. A

Landau T-Bird, 1963 full power, air cond., AM-FM transistor radio, custom wire wheels, 1-owner, $3300. P.V. Pen., FR 4-6664. A

Chevrolet, 1958, Del Rey, 2-dr., floor stick shift, $300. Redondo Bch., 374-2433. A

Buick Century, 1955, r/h, 2 new w/s/w tires, motor & body in good cond., $200. Fullerton, 525-1297. A

Dining Table, 38"x20" console type opens to 90", walnut finish, $45. Lomita, 547-2716. A

Range, Frigidaire elec., $50. Torrance, DA 6-1999. A

Corvair Monza Spyder, 1964 convt., 4 spd., r/h, $1300. Hollywood, OS 6-3475. A

Bookkeeping Machine, Burroughs sensimatic model 200, $100. Northrop Ventura Credit Union, ext. 420. A

Austin Healey Sprite, 1959, head rests, AM radio, $500. Hawthorne, 675-9540. A

Breakfast Nook, curved, w/40" round table, incl. pedestal, approx. 4'x5' sides, $20. San Pedro, TE 3-6814. A

Ice Skates, boy's black figure-type, size 5, $10. Canoga Pk., 346-5958. A

Ford, 1957 station wagon, V-8, $150. Hawthorne, 644-1785. A

Ski Boots, boy's dble. black, size 3, worn 10 times, $15. Norco, 735-1232. A

Unit, 32 deluxe, patio & pool, 1 & 2 bdrm., $360,000. Hawthorne, OR 0-7146. A

For Sale

Room Divider, black wrought iron, poles, shelves, & desk top shelf, $35. Brea, 714-529-1436. A

Pool Table, 8' rack, balls & cues, $20. L.A., PL 4-0078. A

Train layout, HO elec., $35. Brea, 529-3531.

Tape Recorder, all-transistor battery operated, $10. Hawthorne, 676-0418. A

Ham Equipment, Viking adventurer transmitter, Hallicrafter S-40A RCVR, also Hallicrafters UHF communications rcvr., dipole antenna, $75. Torrance, FR 8-1350. A

Rifle, .30-06 Remington auto., 4-X Weaver scope, sling, butt plate & case, $100. Hawthorne, OS 6-1454. A

Bookcase, $10. Lawndale, 371-0194. A

Clothes Dryer, $25. Long Bch., 596-1280. A

Porta-Crib, wooden, $10. Rolling Hills, FR 5-8536. A

Volkswagen, 1961 radio, sunroof, $850. Hermosa Bch., FR 2-5367. A

Volvo, 1957, 1-owner, new brakes, battery, recent tuneup, 20-25 mpg, $325. Santa Monica, EX 9-5413. A

Guitar, Gretsch, Chet Atkins model, de luxe case & amplifier, $295. Hawthorne, 679-7474.

Ford Victoria, 1953 w/h/top, auto., p/s, new seat covers, $100. Inglewood, PL 4-1078.

Crib, Cosco, steel & nylon const., mattress, sheets, blankets & quilt, $25. Redondo Bch., FR 9-3134. A

MGA 1600 roadster, 1960 convt., r/h, new top, tonneau & tires, $900. L.A., 398-6630. A

Ford Falcon, 1960 2-dr. sedan, stick shift, r/h, $450. P. V. Ests., FR 5-0891. A

Rambler American, 1961, Custom, sedan, auto. trans., good tires, $550. Rolling Hills, FR 7-2355. A

Cabover Camper, 1965 Fleetaire, 10½', butane refrig., 12 volt, 110 volt & butane lights, sleeps 4, hardwood ash inter., $1750. Long Bch., 429-4349. A

Train Set, Lionel, plus extra track, cars, & switches, $125. Hawthorne, OS 6-3886. A

Stove, Kenmore, gas, 4-burner, chrome top, glass oven door, griddle, broiler, storage drawer, $35. Inglewood, OR 3-1189. A

Telescope, 6" reflecting-type w/equatorial mount, $99. Orange, 714-KE 2-1232. A

Pontiac, Grand Prix, 1962, auto. trans., r/h, p/s, p/b, new w/s/w, air conditioning, $1995. Lakeview Terrace, 896-3595. A

Ford, 1959, 4-dr. sedan, 6 cyl., stick shift, r/h, new headliner & front seat, $450. P. V. Ests., FR 8-5390. A

Ford Galaxie, 1961, 4-dr. sedan, auto. trans., p/s, p/b, orig. owner, $800. Rolling Hills, 831-9707. A

Ford, 1958, 4-dr., auto. trans., smog device, new battery, $275. Torrance, 371-8564. A

Bicycle, 20" boy-girl convert., ball-bearings throughout, training wheels & V-room motor incld., $20, Torrance. FR 9-5690. A

Buick Special, 1957, auto. trans., p/s, p/b, $200. Hawthorne, OS 9-2710. A

Cemetery Lots, 2, dble. interment, Inglewood Park, El Portal sec., $1600. Garden Grove, 714-892-3552. A

House, 3-bdrm., den w/bar, 1¾ baths, outside rumpus rm. & workshop, dble. gar., lge. lot, $29,900. Inglewood, PL 4-6079. A

Yamaha 80, $200. Downey, TO 9-2673. A

Train Set, Lionel, 3 engines, 11 cars, 2 mechanized, 125 watt transformer, 3 bldgs., 1 tunnel, other misc. accessories, $45. Long Bch., GA 3-1363. A

Pots & Pans Set, Regal, stainless steel, never used, in orig. container, 3 ply 18-8, $25. Hawthorne, 676-6122. A

Oldsmobile, 1957 convt., full power, 48,000 miles, $450. No. Hollywood, PO 1-4103. A

Range, Kenmore, gas, 2-yrs-old, lge. oven, $60. El Segundo, 322-2191. A

Ford station wagon, 1959, air conditioning, r/h, auto. trans., p/s, p/b, w/s/w, other extras, $550. L.A., 474-3433. A

Bow, 35-lb. custom-made, laminated, fiberglass, $25. L.A., 645-1523. A

Acreage, 10 acres near Rosamond, $600 acre w/terms or $5000. Torrance, FR 8-1026. A

Enlarger, 35mm to 2¼"x4¼", condenser & defusion, dustless neg. carrier, Marvel, $10. Hawthorne, OS 5-0606. A

Corvair Monza, 1963, 4-spd., bucket seats, other extras, $1245. Lomita, 326-8959. A

Club Chairs, set, custom-made, reversible cushions, 1-yr-old, $130 L.A., AX 4-5779. A

Corvair Monza, 1961, 4-spd., 35,000 miles, many extras, $795. Inglewood, 759-8920. A

House, 3-bdrm., 1½ baths, extra lge. living rm. & kitchen, h/wood floors, just painted inside & outside, new shrubs & blockwall, $22,000. Sepulveda, 894-0944. A

Ford Galaxie 500, 1962, 4-dr. h/top, 352 cu. in., 8 cyl., Cruise-o-matic, p/s, r/h, w/s/w, $1195. Rolling Hills Ests., 325-5875. A

Monza Coupe, 1965, auto. trans., all extras, $1950. Newbury Pk., 805-498-2529. A

Poodle, platinum, toy, male, 8-wks-old, shots, AKC, $50. P. V. Pen., 377-8817. A

Volkswagen, 1965, 2-dr. coupe, low mileage, r/h, $1725. Hermosa Bch., 372-5131. A

Workbench, 7' long h/wood, drawers, fits DeWalt radial arm saw, $15. Sherman Oaks, ST 8-9709. A

For Sale

Ford, 1953, o/drive, r/h, $50. Torrance, FR 5-0946. A

Bar Stool set, swivel, for 36" bar, oiled walnut legs, white Naugahyde seat & back, $35. Inglewood, OR 4-7743. A

Lots, 4, Holly sect., Green Hills Memorial Park, $1200. Lakewood, 429-6843. A

Shotgun, 12 ga., J. C. Higgins pump-type, model 20 deluxe, cleaning kit, vented rib, adj. choke & recoil pad, $55. Inglewood, 679-7667. A

Bed Set, 2 complete, double, $50. Torrance, 371-6686. A

Home, 4-bdrm., 3-yrs-old, landscaped, custom int. decor, G.I. resale, furn., $29,950; unfurn., $27,950. San Pedro, TE 3-6037. A

Wedding Bands, man's & lady's, matching, Florentine, white gold, can be resized, $100. Hawthorne, 676-1971. A

Pontiac Catalina, 1962, $1500. Lawndale, 371-5822. A

DeSoto, 1956, $75. Lawndale, 371-3991. A

Pickup, 1956 Ford ½-ton, s/trans., o/drive, heater, $450. Gardena, DA 9-3895. A

Corvette, 1962, 300 hp, 4-spd., new Good Year tires, tonneau cover, completely stock, $2450. Compton, NE 2-7635. A

Light Fixtures, 11"x16" bubble Danish import, frosted glass, brushed brass, $10. San Pedro, TE 3-7306. A

Playpen & stroller, $15. Manhattan Bch., FR 6-9864. A

Oldsmobile, 1955 88, 2-dr. h/top, Hydromatic, p/s, r/h, $150. No. Hollywood, TR 7-7251. A

Movie Camera, 8mm, Minolta zoom 8 w/light meter & light bar, w/Sekonic 80P projector, splicer & screen, $150. Gardena, DA 3-6759.

Bookcase Headboard, full-size, blond finish, $25. Gardena, DA 5-5245. A

Vacuum Cleaner, Eureka, 3-yrs.-old, $25. Inglewood, 671-9208. A

Wristwatch, men's, Omega Seamaster, gold auto. luminous & waterproof w/gold expansion band, $70. L.A. 836-3806. A

Studebaker, Lark 6, 1961, 4-dr. sed., r/h, stick shift, $425. Reseda, 342-9319. A

Race Car Set, Strombecker, $15. Torrance, 371-8939. A

Phonograph, portable, Magnavox stereo, $45. Chatsworth, 882-0761. A

Accordion, 120-bass cantino, w/case, $125. Redondo Bch., FR 5-4448. A

Cocktail Dress, marlin blue, floor length, size 12, worn once, $20. Gardena, 323-3245.

Flying Club, 172, no initiation fee, $25 mo., $6 per hr. wet. L.A., VE 7-9813. A

Range, O'Keefe & Merritt, gas, griddle, sep. broiler, shelf converts to cover range top, storage drwr., $40. Inglewood, 671-2170. A

Baby Furnishings, crib & chiffarobe, Whitney, maple, mattress, car bed, infant clothes, blankets, $50. Lennox, OR 2-2370. A

MG TD, 1953, $650. Lomita, 325-1407. A

Ford, 1957 6-cyl., stick shift, 4-dr., good tires, 1-owner, $125. Anaheim, JA 7-8124. A

Pickup & teardrop camper, Dodge, ½-ton, 1961, r/h, auto. trans., dual battery system, new 6-ply tires, intercom & radio to camper, camper is 8' non-cabover-type, many extras, $1495. Torrance, 371-8701. A

Ford Pickup, 1954, ½-ton, $200. Torrance, TE 5-8608. A

Volkswagen, 1962, low mileage, $1000. Gardena, DA 9-4447. A

Sewing Machine, portable, White, $10. Manhattan Bch., FR 2-0720. A

Chevrolet Impala, 1961, 4-dr. h/top, p/s, p/b, $875. Torrance, 371-5697. A

Wanted to Buy

Snowshoes for small woman. Compton, NE 9-3825 before 3 p.m. B

Keys, unusual types for son's collection. Tarzana, 344-3644. B

Laundry Tub, single, & gas dryer. Hawthorne, OS 9-6982. B

Communications receiver that will cover 2-3 MC band, reasonable. L.A., 837-4596. B

Play House, child's, any size. Gardena, 635-3127. B

Freezer in working condition at reasonable price. Box 2101. B

For Trade

Plymouth Fury, 1964 h/top trade $900 equity for transportation car. Redondo Bch., FR 4-2915. C

FREE (To Be Given Away)

Floor Polisher, automatic. San Pedro. TE 1-3518. D

Rentals Offered

House, 1-bdrm., unfurn., trash paid, 220V elec., 3 miles from Northrop, $65. Torrance, 323-9586. E

Apt, 2-bdrm., unfurn., pvt. patio, closed gar., refer., hot water paid, soundproofed, $125 mo. Torrance, FR 5-0867. E

Apt, 1-bdrm, furn., heated pool, gar., coin-operated washers & dryer on ground floor, utilities incl., $125 mo. Hawthorne, OS 9-7123, 644-1700. E

Rentals Offered

Apt, 2-brm., 2-bath, walking distance of Northrop, $125. Hawthorne, 676-9620. E

Apt, 2-bdrm, unfurn., laundry, closed garage, walk to Northrop, $110 mo. Hawthorne, OS 5-3792. E

House, 1-bdrm, small furn., large encl. vegetable garden & yd., carport, tiled shower, rubbish removal & water pd., $80 mo. San Pedro, TE 3-2512. E

Apt, 1-bdrm., $85 mo. Gardena, 324-6277. E

Apt, 1-bdrm., furn., 2 miles from Northrop, $85. L.A., 295-9997. E

Apt, 1-bdrm., unfurn., gar., trash & water paid, 2 blocks from elem. school, 5 min. from Northrop, $79.50 mo., Gardena, DA 9-3436. E

Apt, 1-bdrm., furn., pvt. deck, lge. pool, sub. garage, near Northrop, $145 mo. Lawndale, 377-4372, 679-7426. E

House, 6-room, unfurn., 3-bdrm., 1¾ bath, fenced yd., lawn & water paid, near school & shopping, $130 mo. L.A., PL 4-1964. E

House, 2-bdrm., unfurn., fenced yard, close to Northrop, children OK, $105 mo. Harbor City, 325-5705 E

Apt, 2-bdrm., furn. & unfurn., all extras, close to schools, 10 min. to Nortronics PV, closed gar., encd. yard, soundproofed, $120-$135. Torrance, 375-9397. E

Personals

Wanted girl to share apt. in Manhattan Beach area, $67.50 mo. incl. utilities. Torrance, 379-2124. L

Driving to Chicago, Ill. Leave Dec. 22, return Dec. 28. Will take 4 riders round trip only. Box 2102. L

Will share driving or drive your car to New Orleans for gas. Leaving Dec. 18. Hermosa Bch., 379-9508. L

Thank You sincerely for your kindness, flowers & expressions of sympathy when my mother recently passed away. Special thanks to all my friends in Production Planning for their solicitude. RANDY WALLNER. L

I wish to express my sincere thanks for all the lovely gifts & cards during my recent illness. ISSY FREAS. L

My family & I would like to express our deep gratitude to our many Northrop friends for their thoughtfulness & consideration at the passing of our wife & mother, Gertrude Acord. C. W. ACORD & FAMILY. L

Going my way?

Going My Way forms, C66, are available from organization clerks. Mail GMW forms to Northrop News, 170, Beverly Hills. Deadline is noon Wednesday, one week before publication. GMW ads are run for one time only. If you wish the ad repeated, please fill out another form and forward to the News office.

Rides Wanted

7:30 a.m.—4:15 p.m.

Pasadena or Alhambra area, Alhambra. Adriana Franco, Norair, ext. 2667. 283-5415. 3

8 a.m. — 4:45 p.m.

Rosecrans & Studebaker Rd., Norwalk. T. A. Williams, Norair, ext. 1542, UN 8-2429. 5

Pacific Coast Hwy. & Hawthorne or Crenshaw Blvds., Torrance. R. A. Lawrence, Norair, ext. 1609, 1805, 326-7350. 5

Orange Ave. & Del Amo, Long Beach. W. H. Covert, NSL, ext. 2721, GA 3-1363. 5

Manchester & Lincoln, L.A. Two days a week. John R. Chambers, Norair, ext. 616, 645-8611. 5

3:45 p.m. — 12:15 a.m.

More & Caswell or Wade & Caswell, L.A. Noe Castillo, Norair, ext. 527, 391-4237. 6

Prairie Ave. & 177th, Torrance. Grace L. Watson, Norair, ext. 1834, 370-2304. 6

7:20 a.m. — 4:05 p.m.

Prairie & 182nd, Torrance. Jane Grinnell, Mariposa, ext. 4035, DA 3-4209. 10

Rides Offered

8 a.m. — 4:45 p.m.

Orange Ave. & Del Amo, Long Beach. W. H. Covert, NSL, ext. 2721, GA 3-1363. 15

Universal Tickets Good Any Saturday

Northrop employees holding tickets to Universal Studios who were unable to attend a rescheduled all-Northrop day may still use those tickets for a tour of the motion picture—TV production center.

Universal Studios has advised NRC that tickets will be honored any Saturday for the remainder of this year.

Secretaries Plan To Form NSA Chapter in Conejo

A new chapter of the National Secretaries Association will be inaugurated in the Conejo Valley with an installation banquet scheduled for January 12 at the Los Robles Inn, Thousand Oaks.

Some 30 women from Northrop Ventura, North American Aviation Science Center and Purolator Products, Inc., learned about the new chapter, to be named the Los Robles Chapter, NSA, during a luncheon and orientation meeting in the Ventura cafeteria November 19.

Hostesses were Billie Linebarier, secretary to the controller, and Marjie Shaw, secretary to the director of Quality Control.

Information regarding membership may be obtained by calling Mrs. Linebarier at extension 366.

Symphonaires' Pace Quickens at Yearend

Northrop's Symphonaires, popular NRC-sponsored choral group, have launched their annual "busy season" with the coming of the yearend holiday period.

Included in their activities are appearances and performances at a variety of affairs. Initial 1965 yearend performance was December 3 at a meeting of the Norair Management Club at the Airport Marina Hotel.

On December 11 (7:30 p.m.) the Symphonaires will sing at the Calvary Presbyterian Church, 12515 Acacia. This will be followed by a December 14 (8 p.m.) show at the St. Francis Cabrini Catholic Church, Imperial and Normandie. On December 18 the group performs at the First Methodist Church, Spruce and Kelso, at 8 p.m.

December 21 (8 p.m.) will will find the Symphonaires appearing at the "Christmas Festival of Music" with the Centinela Valley Fine Arts Association at the Hawthorne Memorial Center.

The Symphonaires are under the direction of Paul Brizuela. David Pinto is the accompanist.

There's Still Time To Get Dance Tickets

Northrop's Christmas holiday dance comes off Saturday at the International Hotel and tickets are still available throughout Northrop facilities.

The affair begins at 9 p.m. in the International Room with Les Brown and his band providing music. Tickets sell for $2.10 per person and may be obtained from normal ticket outlets.

Northrop Recreation Clubs at Norair, Nortronics and Ventura are combining to sponsor the dance.

Southland Tourney Set for Bowlers

Keglers representing all Northrop facilities in Southern California swing into action Saturday and Sunday in the 12th annual Northrop Christmas Bowling Tournament.

The site is Tropicana Lanes in Inglewood. Squad times are 10 a.m., 12:30 and 3 p.m. both days. There will be men's and women's singles and doubles events as well as mixed doubles.

One hundred sixty individuals are entered.

Skoshi Tiger Isn't Paper, VC Discover

The squadron of Northrop-built F-5's assigned to Vietnam for combat evaluation is "making life miserable for the Communist Viet Cong," according to an official news release by the Tactical Air Command Office of Information, Langley Air Force Base, Virginia.

The release was based on dispatches from the 2nd Air Division at Bien Hoa Air Base in Vietnam and is reprinted here verbatim:

Viet Cong insurgents, blasted by a flight of F-5As six hours after they flew in from the United States last month, have been afforded no rest from their deadly sting.

In a single strike last week, three F-5A pilots from the 4503rd Tactical Fighter Wing destroyed 39 Viet Cong buildings and recorded five secondary explosions. The action took place at a VC concentration and storage area 40 miles east of Bien Hoa.

A member of the flight, Colonel Frank M. Emory, 47, of Seattle, Washington, commander of the 4503rd, said, "We had a good target and we made the most of it. We saw no ground activity nor did we experience ground fire."

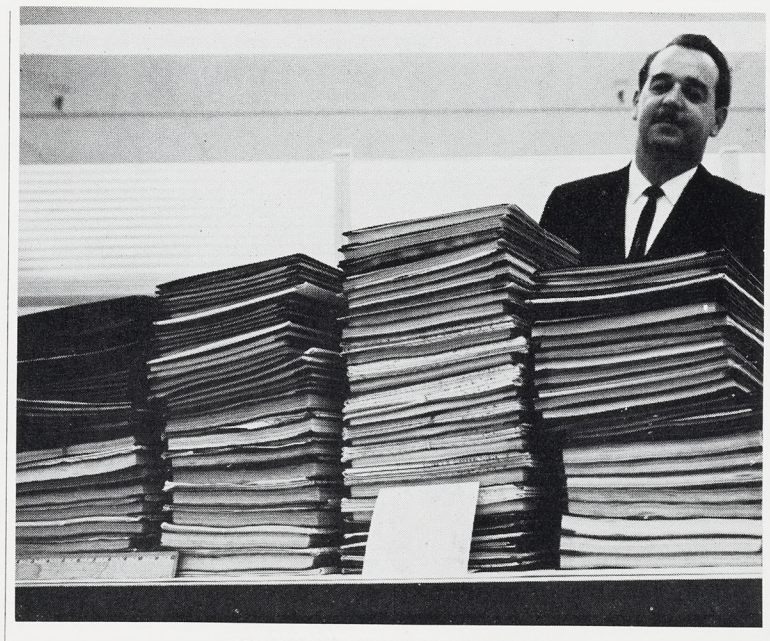
With Colonel Emory on the flight were Major Aubrey C. Edinburgh, 37, of McAdoo, Texas, and Captain Samuel T. Gore, 32, of Houston, Mississippi. This was Colonel Emory's 21st mission against the Viet Cong while Major Edinburgh racked up number 25. Captain Gore has 22 missions.

Freedom Fighter pilots, all TAC veterans, trained for the test program at Williams AFB, Arizona. They logged more than 1000 hours in the aircraft before taking it to Vietnam for the evaluation.

Installation Party Set by Gun Club

Rod and Gun Club officers will be installed during a combined annual Christmas party and installation dinner Saturday at the D.A.V. Hall in Reseda. The deadline for balloting was last Monday.

Tickets are available from officers and members of the Northrop Ventura Recreation Club activity group. The event begins at 7 p.m. with dinner served at 8 p.m.



TOM MILLER WITH DATA PACKAGE.

DATA PACKAGE: 'Toughest Job Is Obtaining All the Information'

(Continued from page 1)

into major subheadings.

"The Data Package must detail final configuration and replacements made during installation, test, and final checkout, indicating serial and part numbers of articles removed and those substituted. It also covers the nature of any malfunctions encountered and corrective action taken. Total operating hours for each system and subsystem is another important item included."

Actually, the end item package is a group of packages, one for each major subassembly, such as the main parachute, drogue parachute, sequence controller, and eleven others. Since several copies of each data package are required, the total number of pages for an Apollo Earth Landing System comes close to 10,000 individual pages.

In addition to data packages for end item delivery, data packages are required for all qualification drop tests of boilerplate models of the spacecraft, as well as spare commitments that might arise during the life of the program.

Mr. Kleinman pointed out that Tom Miller also provides Data Package Support at El Centro and White Sands Missile Range and conducts a multi-lateral effort with Kennedy Space Center—all in his spare time.

According to a spokesman for NASA's Manned Spacecraft Center at Houston, "the Acceptance Data Package goes along with the end item for the same reason the manufacturer included paperwork with the toys you bought your children for Christmas . . . The purpose of the ADP is to define to the next user what he's getting, what has been done to it and what remains to be done."

Considering similar documentation which comes to NASA from other system manufacturers, such as the booster rocket, the spacecraft itself and hundreds of other items, it is no wonder the agency is doing everything it can to simplify the requirements.

Mr. Kleinman pointed out that the Data Package effort certainly is important, but is just one out of several efforts to provide Contractual Documentation.

Bowlers Complete Ninth Week of Play

With the ninth week completed in Northrop Ventura bowling, Teams 5 and 9 remained tied up for the lead in the scratch league.

Team 9, the Pin Pluckers, led the West Valley mixed fours and Team 3, the Errors, were on top in mixed fours at Conejo Village Bowl.

It was 19 and 8 for the scratch league leaders, with Team 10 holding series honors at 1983. Team 5 copped high game with their 697. Both individual high series, 562, and high game, 222, belonged to Augie Quenon of Team 10.

In West Valley play, team high scores were the Spark-a-Mark's 815 game and 2337 series. At Conejo, the Martians took the team high game with their 837. The Wild Deuces' series of 2324 was high.

SPACE: Gemini Six and Seven May Attempt Rendezvous Test

(Continued from page 1)

Sands Missile Range.

In this test, the first Apollo command module of true spacecraft construction will be rocketed aloft aboard a Little Joe II booster. At 70,000 feet, the command module will be blown free of the booster in a manner designed to cause it to tumble, the most severe condition that could be anticipated in an actual Apollo pad abort. Free falling to about 25,000 feet above sea level, the command module will be stabilized to a blunt-end-down attitude and the parachute landing system deployed for a normal landing.

Third of the major flights is that of Astronauts Walter M. Schirra and Thomas Stafford aboard Gemini 6. Last October 25, astronauts Schirra and Stafford were scheduled to rendezvous their craft with an Agena rocket stage already in orbit. The Gemini 6 flight was postponed after the Agena failed.

In order to recover from that loss, NASA intends to launch Gemini 6 approximately 10 days after Gemini 7 and bring the two spacecraft in close proximity to each other in a rendezvous experiment.

The Gemini 6 spacecraft and its Titan II booster must be erected, checked out, and launched from the same pad.

If all flights occur as planned, the two Gemini landing systems would be called upon to do their duty on or about December 18.

OUTLOOK

(Continued from page 1)

of maximum danger and then shutting down the shop when the danger passed. After the Korean conflict we began to realize that while military hostilities might end, international tension would not end, and for a long time to come the world would depend for stability on the maintenance of a high degree of military competence, Mr. Jones said.

Mr. Jones pointed out that defense expenditures in the past have dipped to a low ebb in peacetime and skyrocketed in wartime ($1.5 billion in 1940 and $81 billion in 1945, for example). But since 1953 they have held fairly steady in the $40 to $50 billion range.

"If we look at the world of today rather than at the world of the early years of this century, we can see why we should revise our concepts of defense industry. We can see why it is no longer merely a boom-or-bust industry or a standby facility to be used only in case of national emergency."

PALLET

(Continued from page 1)

000 contracts, the firms will design, develop detailed specifications and produce mockups of a pallet to be placed in the Apollo spacecraft service module.

The pallet will house scientific, technological and engineering experiments to be carried on Apollo missions of up to two weeks duration, beginning in 1968.

After review and evaluation of the design studies, NASA plans to select one of the firms to develop the experiments pallet flight hardware under a cost-plus-incentive-fee contract.

Some of the experiments being studied for Apollo flights will require astronauts to retrieve instrumentation from the pallet and place it aboard the command module for return to earth. Other experiments will transmit data to earth during the mission and will be left in the pallet.

The four firms selected were among nine which responded to requests for proposals issued by the NASA Manned Spacecraft Center, Houston, in September 1965.

Rockhounds to Stage Free Potluck Dinner

Northrop Ventura Rockhounds will throw wide the doors of the Northrop Ventura cafeteria 7 p.m. December 11 for a free potluck dinner.

Ben Sumner, Rockhound vice commissioner and editor of the Rockhound News, said the dinner is open to all Northrop employees and their guests, whether employees or not.

"The only catch," Ben said, "is you have to bring something good to eat to go with the ham we're serving. If you plan to attend, get your favorite dish ready or call Eathel Bondy at DI 4-2626 for suggestions."

In addition to the ham, the club will provide coffee and soft drinks.

The Classics, a teenage combo, will play both rock and roll and other selections during the annual event.

SORRY WE'RE A LITTLE LATE, FOLKS, SO MERRY CHRISTMAS

Recognize these people? Of course you do. It's easy to see that, reading from the left, they're Gladys and Al Ellisen, Ginny and John Gurule, Bob Peterson and Sylvia Recchia, Hope Bowen and Herb McKinney, and Mary and Dick Tupper. They are winners of, again from the left, the first through fifth prizes for the best costumes at the Northrop Ventura Recreation Club Halloween dance. The crowd picked the winners from among 10 finalists selected by Zack Silvers, Ron Gilbert and Mrs. Walter Kniffen. The decorations you glimpse occasionally in the background were cooked up in the caldron of Dottie Prychoda, Tony Piscuskus and Jack Sheridan.

NORTHROP NEWS

Holiday Greetings

Published biweekly by Northrop Corporation, Beverly Hills, California Vol. 23, No. 22 December 22, 1965

Gemini Chutes Recovered; Schirra 'Wants One for Wall'

Among the many new space records established during the historic flights of Gemini 6 and 7, which ended December 18, was the first successful operation of two landing systems within a four-day period.

Also for the first time, part of the Northrop Ventura parachutes were recovered from the ocean for examination and analysis. All parachutes, along with the rendezvous canister, were recovered after the landing of Gemini 6.

"I hope they recovered that parachute," commented Command Pilot Walter Schirra, after he was aboard the carrier, USS Wasp. "I want to hang it up in my den."

Paul Haney, NASA public affairs officer, stated that "recovery of the parachutes is important to determine if there is any degradation of materials during prolonged exposure to the space environment."

Following the flights, Dr. Robert Gilruth, director of NASA's Manned Spacecraft Center, said, "I was tremendously impressed by everyone involved in re-entry and recovery."

Northrop Ventura landing systems developed for both Gemini and Apollo were prepared for a third operation within the same week. The third, however, was called off by postponement of the Apollo mission abort test which had been scheduled for Saturday, December 18, at the White Sands Missile Range.

Gemini 7 Launch Tracked by ALOTS

Northrop Nortronics' Airborne Lightweight Optical Tracking System (ALOTS) was successfully tested during the launch of Gemini 7 spacecraft December 4.

Flying in a KC-135 aircraft at 41,500 feet, ALOTS acquired the Titan II booster as it broke through dense cloud cover above Kennedy Space Center. The system automatically traced the flight until the first stage Titan separated at about 100 miles altitude.

This was the first time Gemini staging was recorded visually.

REPUBLIC OF CHINA RECEIVES INITIAL FIGHTER SHIPMENT

Delivery of the first squadron of Northrop F-5 supersonic fighters to the Republic of China was held December 9 at Tainan Air Base, Taiwan. Major General Dwight B. Johnson, chief of MAAG to the Republic of China, turned over the supersonic jet fighters in a mid-morning ceremony to General Hsu Huan Sheng, commander-in-chief of the Chinese Air Force.

The Republic of China is the fifth of nine allied air forces to receive the F-5 for modernization of its air arm. The U.S. Defense Department has placed orders with Northrop Corporation for approximately 700 F-5 fighters. Twelve F-5s are currently in Vietnam with the U.S. Air Force Second Air Division for combat evaluation.

Participating in the Taiwan ceremony were senior officers of Chinese Air Force headquarters and MAAG officials. Northrop representatives included R. R. Miller, D. D. Darnell, jr., and T. L. McCarthy.

Aeronautical Group Headed by Barber

Appointment of H. W. Barber as chief of the Aeronautical Engineering group at Northrop Ventura has been announced by C. E. Weinert, director, Design and Test Engineering section.

Mr. Barber has been at Northrop for 10 years. His responsibilities have been in the areas of mechanical and structural design, system integration and mechanical systems field development and evaluation.

Dividend Declared

The Northrop board of directors has declared a quarterly dividend of 25 cents per share, payable December 11 to shareholders of record November 26.

COMPUTER BYPRODUCT FINDS USE IN JUNIOR ACHIEVEMENT WREATH

A by-product of the computer age has joined forces with the Christmas spirit to provide a product line for a Junior Achievement firm operated by Thousand Oaks High School students.

In keeping with the season, the junior achievers are manufacturing and selling decorative Christmas wreaths. The chief ingredient consists of used IBM cards for the

Photo on page 5

computers at Northrop Ventura, the Conejo Valley company which for the third consecutive year is counseling Ventura County's only Junior Achievement organization.

Under guidance of Northrop counselors, the company was formed by 19 students shortly after beginning of the current school term. Its name is Conejo Achievers Company with the abbreviated trade name CONACO.

Meeting each Monday night at the Thousand Oaks Community Center, the youngsters issued and sold stock, chose their product line, and now are busy manufacturing and selling the wreaths at a price of $2 each.

Among the 19 students learning the American free enterprise system through first-hand experience is Seree (Jim) Damrongshat, a senior going to school in Thousand Oaks this year from Thailand.

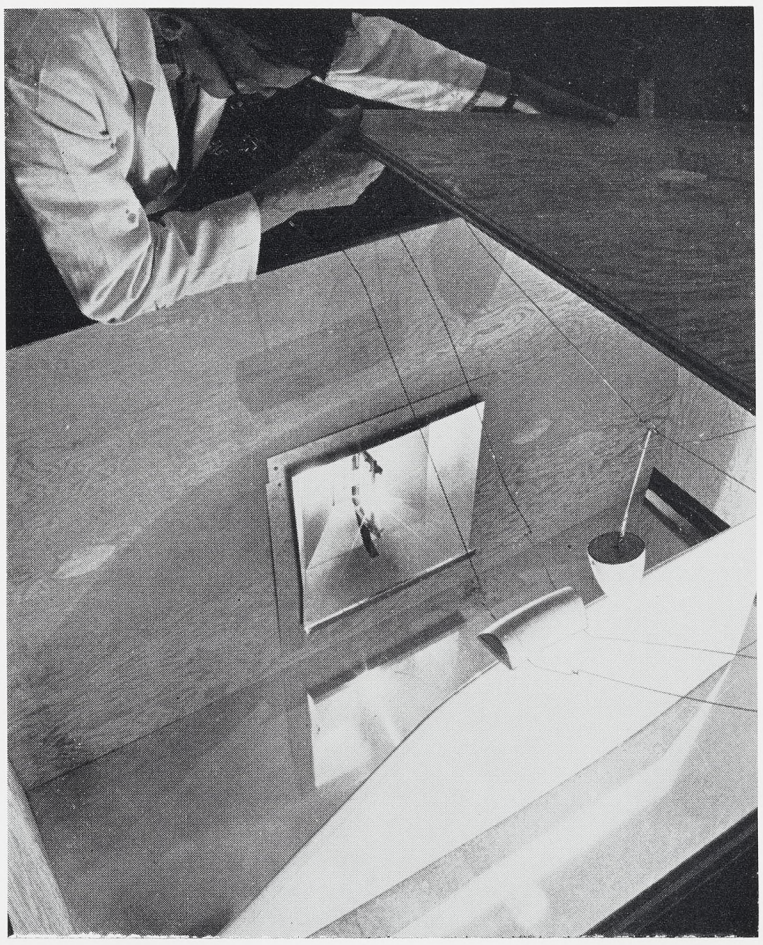
Navy to Evaluate Voice Alert Unit

An advanced version of the voice warning system which alerts Air Force B-58 bomber crews to emergency conditions during flight will soon be evaluated for application to Navy aircraft.

The Nortronics Division of Northrop Corporation will provide 34 of its Mark I voice warning reproducer sets to the Navy Bureau of Weapons for flight testing aboard Navy P-3s, F-4s and A-5s. The voice-alert units will augment present in-flight monitoring systems, such as instrument panel warning lights. The taped messages will be varied in order to determine specific aircraft requirements.

Through a network of remote fault sensors, the Mark I will directly monitor airframe condition and aircraft system status.

STRANGE ENVIRONMENT



Environmental acceptance testing of plastic parts developed by Northrop Ventura for a U.S. aircraft manufacturer includes exposure to ultraviolet radiation from twin carbon arcs. Ed Worrell, Research and Development technician closes cover of chamber prior to test of fin and two small radomes for a jet fighter. Wires across compartment hold items in place.

$10,000 SAVED IN HOLIDAY DRIVE BY SUGGESTION AWARD PROGRAM

With more than 125 cost improvement ideas submitted, Northrop Ventura garnered a $10,000 saving in a pre-Thanksgiving employees suggestion award program.

Twenty-four suggesters received cash awards and turkeys and an

Photo on page 3

additional 35 got turkeys, all in time to consume the birds on Thanksgiving Day.

The top monetary prize was $390 to Francis L. Hicks of the Maintenance department for his suggestion reducing the operating costs of the air conditioning system. A manual control switching device now permits reduced electrical power consumption during minimum load periods about 12 hours each day.

Jack L. Landis of the Electronic Fabrication group earned $120 for his idea in improving fabrication methods for parachutes. He suggested heat basting of seams instead of hand tacking or gluing.

Sixty dollars went to Sarah E. Hudgins, Records and Release branch, for her idea that two duplicating machines be placed on separate electrical circuits.

Winners of $30 awards were Robert Dykes and Josephine Orefice.

Twenty dollar awards went to Grady Means and B. H. Webster.

Recipientes of $15 each were Alexander Blackwood, William Cope, Flo Johnson, Gerald Siebers, Ray Uribe and Steve Wrubel.

Ten dollar winners were C. W. Atkins, John Baker, James Bamburg, Les Bradley, A. P. Douglas, S. M. DiPasquale, Lloyd Eastman, Joan Garfield, Helen Palenko, Mel Pierceall and Marvin Shered.

VENTURANS LEND HAND TO SCHOOL FOR HANDICAPPED

Northrop Ventura employees looking for a worthwhile Christmas donation recipient can turn to the Conejo School for Child Development in Thousand Oaks.

The school for neurologically handicapped, brain-injured and emotionally disturbed children opened its doors in March 1965. The unpaid head of the school is Mrs. Francis Hicks, who had worked for Northrop Ventura's Accounting department in Van Nuys as Mrs. Mary Volpe.

The only financial support for the school comes from donations, since mentally handicapped children receive no state or federal aid until they are eight years old.

Venturans have already begun giving to the school; for example, a typewriter has been provided by Bernard W. Montag, jr., controller, and three tricycles and a record player by members of the PBX department; Corinne Samuelson, Laura Stump, Gloria Correy and Verni Bloom.

The school can use such things as desks and playground equipment, or volunteer services.

Donations are tax deductible and may be volunteered through Billie Linebarier, Room 200, Administration building; Tamara Tracy, Room E-123; Margie Shaw, Room M-1101; Eileen Munro, Room M-1125; or Chili Daly, Room A-139.

Golfers at Knollwood For Final '65 Match

Northrop Ventura Golf Club will return to Knollwood Golf Course next Wednesday for the 1965 closer after being rained out at the Granada Hills course November 26.

The Knollwood event is the second half of a yearend double header that found the divot diggers traveling to Ojai December 11. Ojai is a favorite of the Venturans, who take on the tricky 18 holes at the country club a half dozen times each year.

At Knollwood they'll be up against a hilly, tough course that not only taxes a golfer's capabilities, but his legs as well.

BEST WISHES

To all Northrop Personnel:

Mrs. Jones and I extend to you and your families our warmest greetings for the Christmas holidays and our best wishes for a Happy New Year.

This year our fellow employees are observing Christmas in Allied countries around the world as well as across the United States. Whether it be Bonne Noel, Feliz Navidad, Froliche Weichnachten, Buon Natale, or the more familiar Merry Christmas, I wish to convey to everyone my hopes for a joyous holiday and my sincere appreciation for the continuing effort which makes it possible for us to start each new year full of anticipation for individual and company advancement.

Thomas V. Jones
President and Chairman

To Northrop Ventura Personnel:

Mrs. Douglas and I extend our sincerest wish that you and your families will have a warm and joyous Christmas, and a New Year of prosperity and happiness.

Especially I thank all of you for the effort and loyalty devoted to our division and its programs during 1965. Only through such work and loyalty will we be able to maintain our position within the highly-competitive aerospace industry.

I am confident that, with your continued help, 1966 will be a year of new growth and opportunity.

George F. Douglas
Corporate Vice President and
Northrop Ventura General Manager

Fortnight in Review

Golfers who won in Nortronics Twilight League (photo below) at Los Verdes and Alondra golf courses line up with trophies received earlier this month at Palos Verdes. They are, from left, John P. Overholser, Ted Deguisne, Gerald Duket, George Chalmers, Jack Koletty and Dave Lipscomb. Missing from presentation were winners Bill Mahlman, Ed Kong, Bob Harrod and Fred Woods. In photo at right, Dr. Donald A. Hicks, vice president and manager of Nortronics Applied Research department at Newbury Park, presents 15-year service pin to Helen Kramb, administrative secretary to the controller and director of Administration.

Barry Riley Studies Democracy In Africa on Somali Assignment

Barry Riley is in eastern Africa for a year, representing the National Geographic Society and Shell Oil Company and writing a book which will also serve as his Ph.D. thesis.

Barry, son of Len Riley, who is head of Purchasing, Material Proposals and Advanced Planning at Palos Verdes, will write his thesis on the Somali Republic government. He has already completed the academic requirements for his doctorate at Johns Hopkins University, Washington, D.C.

The younger Riley is in Mogadishu, capital of the small country with what is reputed to be one of the most democratic governments in the world. The capital city is a seaport on the Indian Ocean with a population of 90,000.

Barry received his M.A. in international law and diplomacy from Stanford University. His sponsorship by Shell and the National Geographic Society was based on scholastic excellence.

He will submit his thesis not only to the School of Advanced International Studies at Johns Hopkins toward obtaining his doctorate, but to Shell Oil, which is providing a $5000 National Science Foundation Fellowship award for completion of the book.

A collection of camera equipment recommended by National Geographic will help Barry get pictures up to the internationally famous standards of that organization.

Like his father, holder of more than one tennis doubles trophy, Barry is an athlete. He was offered a track scholarship to Stanford as well as the scholastic one he accepted. While at Stanford he made the freshman track team in the high jump and pole vaulting, but injured his back and dropped out of competition.

Before returning to Southern California, Barry will spend five or six months on tour around the world.

Conejo NSA Group Meets New Officers

A pre-charter get-acquainted dinner brought together members of the Los Robles Chapter, National Secretaries Association, at Conejo Lodge in Thousand Oaks, December 14.

During the meeting, the officers, who will be installed January 12, were introduced. Each charter member, also, was asked to introduce herself and deliver a brief sketch on her background.

The new Los Robles Chapter includes secretaries from firms in the Newbury Park industrial park.

The officers are Sylvia Savage, North American Aviation Science Center, president; Billie Linebarier, Northrop Ventura, first vice president (membership); Frances Jewitt, NAA Science Center, second vice president (programs); Marian Morioka, Purolator Products, Inc., secretary; and Jodi Letts, Packard Bell Electronics, treasurer.

Rockhound Movie

The Northrop Ventura Rockhound Club will show "The Secret Desert," a motion picture about ghost towns, lost mines, jagged mountain peaks and twisted canyons on January 14.

MED DELIVERS MARINE CONTROL SYSTEM TO SUN

The first of six marine control systems, developed by Northrop Nortronics to centralize previously scattered engine room instrumentation and controls, has been delivered to the Sun Shipbuilding and Drydock Company, Chester, Pennsylvania, for installation aboard the SS Santa Lucia.

The centralized control system, built by Nortronics' Marine Equipment Department, Needham, Massachusetts, will permit two men to monitor and operate turbines, boilers and other equipment which currently require large engine room crews. The system will also permit direct control of the main engine from the bridge.

In an emergency, one man can accomplish all the engine room tasks required to operate the ship.

The SS Santa Lucia is the first of a new class of cargo ships, designed by naval architects Gibbs & Cox, being built for Grace Line by Sun.

All told, more than 50 operations will be accomplished simply by pushing buttons on the engine room control console. In addition, 100 points in the engine room will be continuously monitored with alarms provided for abnormal temperatures, pressures and liquid levels.

An automatic bell logger will record information such as propeller speed, throttle commands, and time of day—information which previously was hand recorded.

Bassett Space Walk Holds Special Interest at Ventura

Captain Charles A. Bassett II, the astronaut who won the support and friendship of Northrop Venturans on a plant visit last May, has been named to take America's second walk in space.

NASA announced last month that Astronaut Bassett will be copilot for Gemini 9 flight, tentatively scheduled for July of next year. Elliot M. See, jr., a civilian astronaut, will be command pilot.

Plans call for Astronaut Bassett to remain outside the Gemini capsule for at least one complete trip around the earth while anchored to his ship with a 200-foot lifeline. He will be the first to wear a self-propelled maneuvering unit on his back.

Astronaut Bassett visited the Ventura plant May 3, at which time he addressed a gathering of all employees and was principal speaker at a Management Club meeting.

During his talks he praised the soft landings which all astronauts to date have experienced with parachute landing systems developed and manufactured by the Division.

Mr. See and Captain Bassett also will attempt again to rendezvous with an unmanned Agena satellite put into orbit ahead of them. This was the mission of Gemini 6 October 25 which never got off the ground when the Agena exploded after launch.

The actual docking experiment, which is vital to plans for returning Apollo astronauts safely to earth after their landing on the moon, has been assigned to Gemini 9.

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Betty Tarquinio Services Held

By ROLAND HARVEY
Northrop Ventura Timekeeper

A profound sense of loss was experienced among the many friends of Betty Tarquinio, who passed away November 22.

Following Rosary November 26, funeral services were held at St. Paschal Baylon Catholic Church, November 27 in Thousand Oaks.

Mrs. Tarquinio

Born February 1, 1927, Betty joined Northrop Ventura May 1, 1956 as a combination switchboard and teletype operator and was made senior TWX girl in June 1957. She performed her duties for almost a decade in her own inimitable, cheerful, smiling way up to October 5, when she was hospitalized.

Betty is survived by her husband Joseph and her mother, Florence Warren.

Acquiescing to what, we are sure, would have been her wish, we would like to reprint an old but fitting poem as an expression of our sorrow:

"You never miss the water until the well runs dry, you never miss the sunshine until it leaves the evening sky, you never miss the summer until the snow begins to fall, and you never miss the ones you love, until they've gone beyond recall."

Winners of three top awards for employee cost reduction suggestions at Northrop Ventura (left photo) receive their checks from Ken Geller. Recipients are (from left) Jack Landis, $120 award; Sarah Hudgins, $60; and Francis Hicks, $390. Approximately $10,000 in division savings was accomplished by incentive program during Thanksgiving period. New Northrop Ventura Management Club officers (photo above) who were introduced to membership at annual banquet and dance December 4 are (from left): Bill Young, Ron Waters, Charles Olmstead, Don Archer, and seated in front is Eileen Munro.

Christmas Spirit Has No Season

By WILLIAM LARRABEE
Vice President—Industrial Relations

Most of us think of Christmas as the season for the giving of gifts to our families and friends. At Northrop, however, we have a tremendous number of people who pack a little bit of the spirit of Christmas giving into their daily lives. They do this without fanfare and without seeking or receiving any recognition other than the satisfaction of helping others. They give not only of money but also of themselves and of their time in all kinds of charitable and civic activity.

One of the best examples of what Northrop people can do when they set about it is our "Adopted Family" program. Some 11 years ago a group in Manufacturing at what is now Norair recognized that every one of us has a run of misfortune at one time or another and that Christmas could be pretty bleak unless something were done about it.

Mr. Brazil

They decided that they would see to it that some families had a Christmas which just couldn't be there otherwise, and they "adopted" three such families. I talked to Tom Brazil who has been in the program since the start. He told me how word of what had been done spread within the company and how the plan grew throughout the years. This year 71 families are being "adopted" and each of these families will have a real Christmas. Marie Tully at Norair and Verda Campbell at Nortronics, who work so hard on this program, could tell you of the joy which has been brought into Northrop homes because a small group of people followed through with an idea 11 years ago.

All of us know about the Red Cross and its blood bank programs. About 10 years ago, a few devoted people started working with the Red Cross in a small way to build up a Northrop blood bank account. The net result is that almost 20,000 pints of blood have been made available to Northrop people and their families to help when illness struck. All of us are grateful to people like Mrs. Mary Jo Horn, who, according to our records, is our champion donor.

Mrs. Horn

Our NORAID program was started 10 years ago by a small group of men who thought that there should be a means whereby contributions could be made by all of our people as a group of charitable causes and the least fortunate among us could be helped by donations from the rest of us. The company offered to handle payroll deductions. George Gore has been with the program from its inception and for the past eight years has been chairman of the NORAID board. He tells me that since it was started, NORAID has distributed over $500,000 in direct grants without strings attached to fellow Northrop people in need.

Mr. Gore

Anyone who has not attended the annual Children's Christmas party at Hawthorne has missed a real treat. Somewhere around 4000 children of Northrop employees head for the North Pole which is complete with Santa Claus, Santa's helpers and a whole group of Northrop Recreation Club volunteers who get as much enjoyment out of it as the children. Similar get-togethers for the youngsters are held at other Northrop facilities.

There simply isn't room in this issue to talk about all of the other things which our people do. Among the charities, we would have to tell about the Conejo School for Child Development supported by our Ventura Division personnel. We would have to discuss Junior Achievement programs, Scout activities, Chamber of Commerce and PTA work, the YMCA, and many more. We can truthfully say as we enter upon our Christmas holiday that we have every right to be proud of being associated with men and women who contribute so much to their communities and the well being of others.

Festive decorations add to spirit of season at hand throughout Northrop. Verda Campbell (above) adjusts Nortronics Anaheim tree. Charlotte Skipper (below) bedecks Palos Verdes rubber tree.

Photos by: Val Hawes, Nortronics; Ron McGaffin, Norair; Chuck Ramsey and Bob Steingart, Northrop News; Bob Thornton, Ventura; and Ike Murata, Norair.

NRC Symphonaires lift their voices in traditional airs of the season for members of the Northrop Norair Management Club. Group, composed of representatives from several facilities, is under the able direction of Paul Brizuela.

Carol Finds Joy Helping 80 Orphans

Carol DePauw can celebrate Christmas this year with the true joy of one who has given to those less fortunate.

Miss DePauw

A dozen or more of Carol's weekends this year were spent in La Mission, Mexico, washing, sewing and ironing for 80 children at the Open Door of Faith Orphanage. Last weekend she took time out from women's work to help install plumbing in a new dormitory for the parentless Mexican children.

Carol, a secretary in the Research Design branch at Norair, belongs to a group of single American men and women who are working to better the lot of the orphans.

The members of this nameless organization took with them last Saturday and Sunday a pinata and all the festive homemade goodies necessary for a Christmas party.

They helped Papa and Mama Freeze, the American couple who run the orphanage, take care of the children. They handled the arrangements for the party.

Carol says the dormitory project is particularly important, since the one in use now is overcrowded beyond all rules of safety.

"We can use all the help we can get," she said, "to finish the new building. We'd also like to get some shoes and socks for the children, to help keep them warm this winter."

Carol specified shoe sizes for children from infants to 15 years, and white stretch socks that can be worn without regard to matching pairs. Flannel sheet blankets are another needed item.

They can be sent to her at her home, 3605 Palos Verdes Drive North, Palos Verdes Estates, California.

IN THE INTE

Highlight of the pre-Christmas social whirl is traditionally an all-Northrop dance sponsored by combined NRC Councils. Scenes here were snapped at International Hote December 11 when employees from all divisions and thei guests enjoyed fun-filled evening, including dancing to music of the Les Brown Band.

Christmas Now Comes

Christmas comes in July, too.

At least it has for personnel in Northrop Norair's Manufacturing Research and Development group since Nguyen Manh Bao came into their lives five years ago.

Nguyen Manh Bao, or simply Bao, is an appealing, lovable and sensitive little resident of South Vietnam who considers each individual in the group as his "special" foster parent.

Manufacturing R&D employees return this feeling many times and regard Bao as another son. Thus, everyone joins in enthusiastically in July when gifts must be obtained and shipped to assure their arrival overseas by Christmas. Then in December funds are raised to support Bao for another year and at the same time, the group "adopts" a needy local family for Christmas.

One of the leaders in the Bao project, Paul Warren, explains how it got started:

"In 1961 we reasoned the exchange of Christmas cards was redundant and the money saved, plus a little more, could be put to a better use. We looked into several ideas and decided to support the Foster Parent's plan on a one-year trial basis. Through it we met Bao and lost our hearts."

Participation is strictly voluntary. Most of the 35 employees give on a sliding scale based on salary. The average donation is between $8 and $10 each per year.

The total is ample to pay the basic cost of $180 per year and provides a surplus for gifts at Christmas, birthdays and other special occasions.

The basic fee assures Bao and his family of a cash allotment each month, special food and clothing parcels, additional rations of staples, sanitation and personal hygiene items, medical attention and a rare opportunity for schooling. It provides help for the entire family.

Bao's parents came to South Vietnam from the north in 1954 to escape the Communists. There are now three brothers and his parents. His father earned 41 cents per day as a barber until tuberculosis forced him to quit work. The mother is now the sole breadwinner, earning 13 cents daily selling rice cakes.

The first Nguyen home near Saigon was a simple one-room

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Change of Pace in Store for Many As 10-day Yearend Holiday Begins

As normal work shifts end tomorrow, thousands of Northrop employees on the West Coast will lay down their tools, silence their machines, lock up their desks, exchange last-minute greetings, and depart to join their families on a 10-calendar-day yearend holiday.

Throughout Northrop the exodus will be general and complete.

Only token security, maintenance and services personnel are expected to maintain lonely vigils until work resumes January 3.

Personnel normally manning medical, insurance, cafeteria, transportation, mail and other services will also be on holiday so their functions will be closed. And except for a few isolated recreational events scheduled, all personnel activities will also close.

The latter will include some 100 people who will wing their way westward toward a Hawaiian Christmas under the auspices of the combined NRC Travel Clubs.

Sailing Club members will hoist their sails and head for a December 29 installation dinner at Catalina Island. Golfers will iron out the kinks with a two-day (December 27-28) tournament over two courses.

Ski Club members will take advantage of abundant snow at higher elevations with a trip to Mammoth Mountain. And the rockhounds will head eastward toward their favorite desert assembly points.

But for the majority of Northrop families the period ahead promises a welcome change of pace. They plan to slow down and relax.

Over the past few weeks the traditional yearend slate of events have carried employees and their families at an ever-quickening pace.

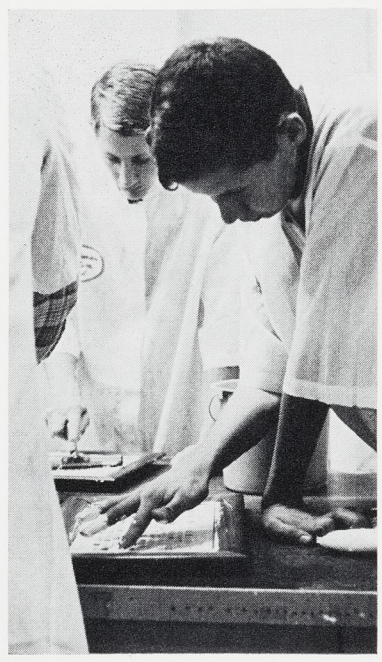
Augmenting informal get-togethers have been all-Northrop events such as the Christmas dance held at the International Hotel December 11 and a bowling tournament December 11-12. They helped to bring together old friends from many divisions and facilities.

Too, there have been the annual round of NRC-sponsored events, including some special ones in which Northrop youngsters were kings. Over the past weekend kids' parties were scheduled at Hawthorne, Anaheim, Palmdale, Huntsville, Alabama, and Kennedy Space Center, Florida.

Northrop parents took part, of course, but the emphasis was on youth. There were fun-filled games, contests, ample refreshments and gifts galore. And each afforded the youngsters an opportunity to "talk business" with Santa Claus.

Because Northrop people have long followed a custom of turning their thoughts to others less fortunate at this time of the year, much of the recent emphasis has centered around charitable activities.

Chances are, the final tabulations will show more than 100 families have benefited from the generosity of Northrop people.



And there are hundreds of patients and wards in hospitals and institutions who will also share in this generosity.

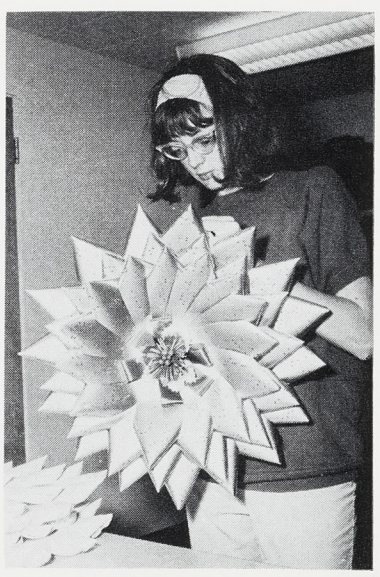
Northrop's Corporate office, Norair and Nortronics Divisions have long practiced the custom of "adopting" families for Christmas, sharing each individual member with gifts, food, clothing and other necessities. This practice begins internally with Northrop's needy handled first, then expands into communities and areas near Northrop facilities and even to far-off points where a need exists.

At Northrop Ventura the Dollar Donors, Inc., distributes gift certificates for food, clothing, gifts and necessities to known needy families within the division. It is a custom there to disperse a majority of funds retained for in-plant assistance at Christmas time.

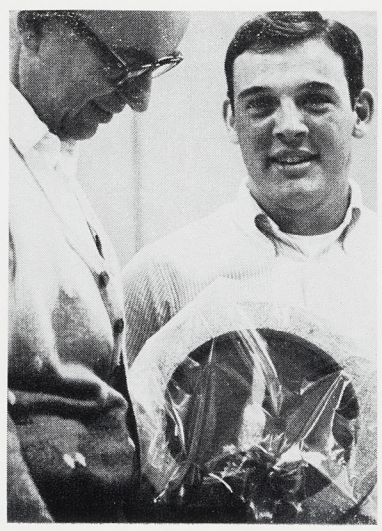
Northrop Architectural Systems has dispatched 950 pounds of foodstuff, along with a giant Christmas card signed by all 300 employees, to the U.S. Marines in Vietnam. Dale Albee, Personnel supervisor, reports each employee gave a maximum of $1 to cover costs. Delivery of the packages was arranged with the El Toro Marine Base. And NAS also provided gift baskets for employees away from work due to illness.

A few last minute reminders were being made this week as the holiday season approaches. Each employee can help by performing a safety inspection of his immediate area. Be sure all Christmas decorations are removed, shut off running machines, lock up all classified files, close windows and be sure everything is secured for the period ahead.

Northrop paymasters are distributing their special blend of Christmas cheer today and tomorrow.



Whether it's Christmas decorations or unusual gifts you're looking for, five Junior Achievement companies sponsored by the three Northrop divisions can deliver the goods. Below (from left) a young craftsman of Nortronics Hawthorne-sponsored Custom Craft firm paints wooden frame for serving tray; Mike DiDonato, president of Verse Kraft, sponsored by Northrop Norair, holds Christmas wreath; Counselor Leo Gross and members of Nortronics Anaheim-sponsored Trivco ready trivets for baking under heat lamp. At left, Terry Gilbert, president of Minico, sponsored by Norair, holds Christmas candle table decoration. At right, Kathy Mantle of Conaco, sponsored by Northrop Ventura, completes wreath. Above is a segment of of the Custom Craft production line working on serving tray.



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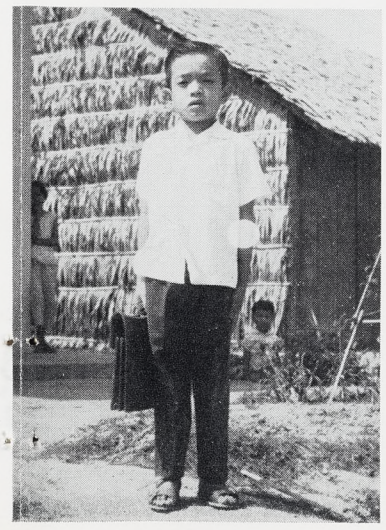
hut made of leaf without a floor. In 1963 this was destroyed in a fire that swept the area.

Informed of the disaster and the fact the family was living in a tent, the Norair group collected a special fund of $150. It helped the family build a new and larger home of concrete and brick with a metal roof and also their first kitchen. It also helped the family pay outstanding debts.

One of the requirements of the Foster Parent's plan is the monthly exchange of letters between foster parents and the child. These have given the Norair group a vivid picture of life in a war-torn nation.



Bao, through a case worker, writes of many things. He tells his parents of his schooling (he ranks fifth in a class of 75) and of special holidays and excursions. He is fond of animals and growing things. He likes photographs and colored post cards and especially magazines and periodicals.

He tells how he and his schoolmates "sing unanimously," "do gymnastics" and how he "studies hard to be able to succeed rapidly." He begins each letter with a polite query as to the health of each of his parents. He is very careful to list each item he has received. And he frequently tells of sharing his gifts and toys with others.

Norair parents, in turn, tell Bao of their own families, their day-to-day activities and places and things of interest to him. The letter writing is shared by all the group.

There is never a doubt that Bao, who is just 10 years old,

(See FOSTER CHILD, page 6)

MANUFACTURING

Wing Assemblers Collar 'Fastest Gun in the West'

Northrop Norair Wing Structures personnel now have their own candidate for the title of "fastest gun in the west."

It is geared more to speeding production, reducing costs and waste and eliminating a tedious operation than gunning desperados and protecting the old homestead.

But it is fast and a real gun—an automatic collar installation gun known affectionately and simply as "the gun."

Northrop Norair assemblers utilize "the gun" in installing about 60 percent of the more than 2000 3/16th-inch Hi-Lok fasteners found on the upper surfaces of both T-38 and F-5 wing assemblies.

Before "the gun" made its debut, this operation called for inserting Hi-Loks in countersunk holes and then shooting them with rivet guns to insure proper settings. Hi-Lok collars, all 2000 of them, were then inserted and screwed down by hand. Offset guns were then used for further tightening and to breakoff tips at a given torque. Total time: about four hours.

Now the first two steps in the old routine are taken and "the gun" takes over. It inserts the collars, tightens them and performs the breakoff all in one swift operation. It draws from an attached eight-foot plastic hose (with a capacity of 200 collars) required materials. Total time: about 30 minutes.

An automatic loading machine is a related item for reloading plastic hose reservoirs.

Perfection of this technique has been a joint venture between Norair's D. G. Reed, Wing Structures general foreman, G. T. Costa of Standard Tool Liaison and Jerry Bynum, sales engineer for Hi-Shear Corporation, manufacturers of "the gun."

Changes have been made to fit special requirements in prototype units. Now on order and expected momentarily are standard production units. Meanwhile, "the gun" or prototype unit is filling the bill.

"Naturally, our assemblers love this system," Mr. Reed said. "We find it cuts production time and costs, helps curtail waste and makes for a happier group of men."

Mr. Reed also feels this technique may be expanded into other areas and other uses. At present attention is being given to a collar gun for ¼-inch collars.

WITH A BANG, ZIP—D. L. Walton shows G. T. Costa (left) and Al Arthurs how fast automatic collar installation gun installs Hi-Lok collars on F-5 wing at Northrop Norair. Gun handles task in 30 minutes that once took four hours. Collars are drawn from silvery plastic tube with capacity of 200. About 2000 of these fastener units are found on each upper F-5 and T-38 wing.

Munsters Win '65 Football Crown

Manager Frank Warga's "Munsters" punched out a 20-12 victory over Manager Jim Owen's "Packers" December 11 to win the NRC flag football championship for 1965.

Carroll Hicks was named most valuable player for the "Munsters." Led by Captain John Massey, the team is composed of John Leffingwell, Larry Beuder, John Monson, Phil Fetchko, Stan Bunn, Carl Newman, Steve Perkins, Bill Howe, Don Akins, Bill Greene and Wayne Maples.

Tennis Team Being Formed for League

Tennis players from all Northrop divisions are being sought to man a Northrop entry in the West Los Angeles Industrial Tennis League opening play January 23.

This league, composed of top notch players from eight major industrial firms, will compete on alternate Sundays through May 15.

FOSTER CHILD

(Continued from page 5)

recognizes and appreciates the opportunities being offered him through the Norair group's support. Each letter mentions this fact with such phrases as "I am honored to be helped by you" and "though living far from you I always think of you and your great favor."

And perhaps the thoughts of this small boy, sent across the seas from a troubled world, best captures the true meaning of the season at hand. Bao wrote:

"On the occasion of the coming Christmas and New Year's I pray to God to bless all of you with happiness, longevity and the best of everything."

F-5 Most Effective Fighter, Filipino Pilots Claim

"None of us flying the airplane would trade it for another," said a Philippine Air Force pilot, who had just set down in an F-5 at Williams Air Force Base, Arizona, last summer.

"The F-5 is the most effective tactical fighter plane in use in the world today," he added.

Today, that pilot, who received training in the F-5 at Williams through the U.S. Military Assistance Program (MAP) is training other members of the PAF 5th Fighter Wing, and the wing has nine brand new F-5's of its own.

Delivery ceremonies October 25 saw Diosdado Macapagal, then president of the Philippines, accept the F-5's on behalf of the Philippine government from U.S. Ambassador William McCormick Blair, jr.

Northrop was represented at the ceremony by Senior Vice President Robert Miller and Milt Kuska, Dan Darnell, Bill Wier and Dick Allen of Norair.

Air Force officers of both nations attending were Major General Victor H. Dizon, PAF commander, Brigadier General Joe Ramos, PAF vice commander, Brigadier General James R. Winn of the U.S. Military Assistance Group, and Colonel William Lawley, USAF air attache.

Colonel Emmanuel Casabar, commander of the 5th Fighter Wing, is one of the most enthusiastic supporters of the F-5 and was one of the first PAF pilots to successfully complete the training courses at Basa Air Base, Pampanga, home of the Wing.

Major Angel Okol who, along with five other PAF pilots, spent five months at Williams AFB, is supervisor of the pilot and maintenance program at Basa Air Base. Major Okol was named outstanding member of his class at Williams.

More than 50 PAF maintenance personnel also were trained at Williams. They are now in-

(See PHILIPPINES, page 8)

F-5 Reliability Proven With Pioneer Effort

Northrop Corporation has successfully completed a formal reliability demonstration program for the F-5 tactical fighter.

This accomplishment follows an earlier, and equally successful, demonstration performed on the T-38 trainer.

Mr. Harter

Northrop is one of the first major Air Force contractors to contractually commit to and demonstrate aircraft reliability, and the first to have accomplished this on two airplane programs.

In both T-38 and F-5 demonstrations Northrop has met or exceeded all established reliability requirements and goals.

"This is an enviable record and an accomplishment in which each Northrop Norair employee involved shares with equal distinction," said W. W. Harter, Norair chief of Reliability.

In addition to the obvious successes attained, Northrop has additional right to be proud, since it played a pioneering role in the formulation and application of a formalized reliability program for an airplane development and production program.

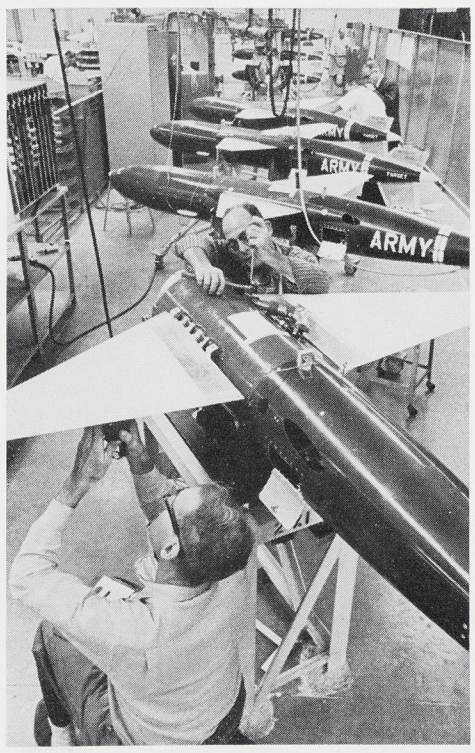
Techniques for reliability prediction, measurement and demonstration had to be developed. Northrop was the first to use Air Force maintenance data for reliability monitoring. The success of the T-38 reliability program has received national attention.

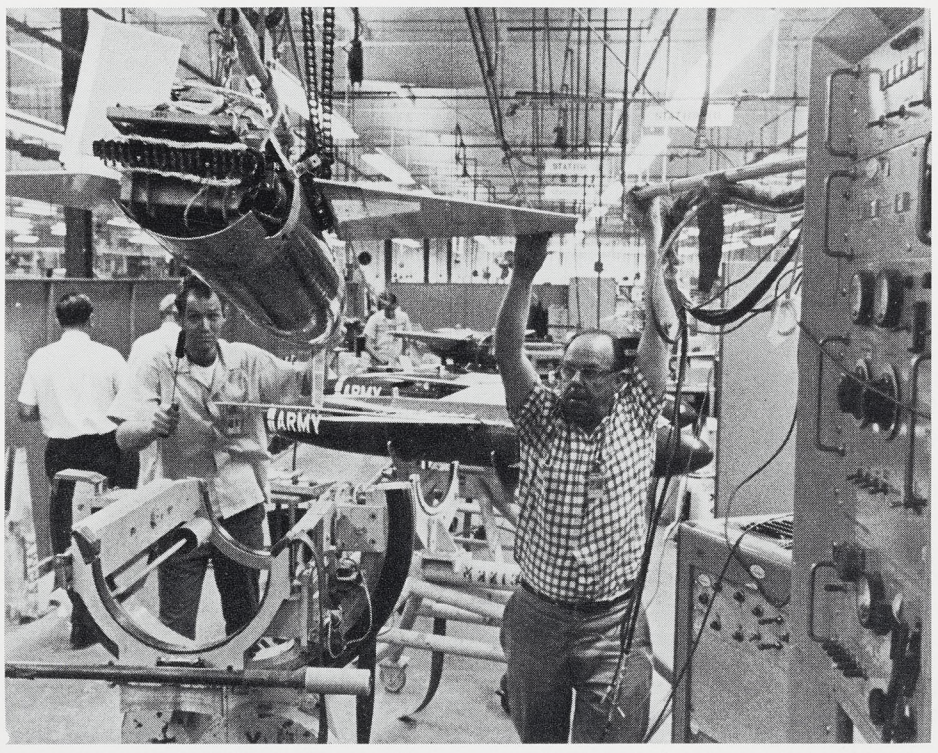
Fred H. Behrens, chief, Operations office, directorate of Avionics of the Air Force Systems Command, said of the program:

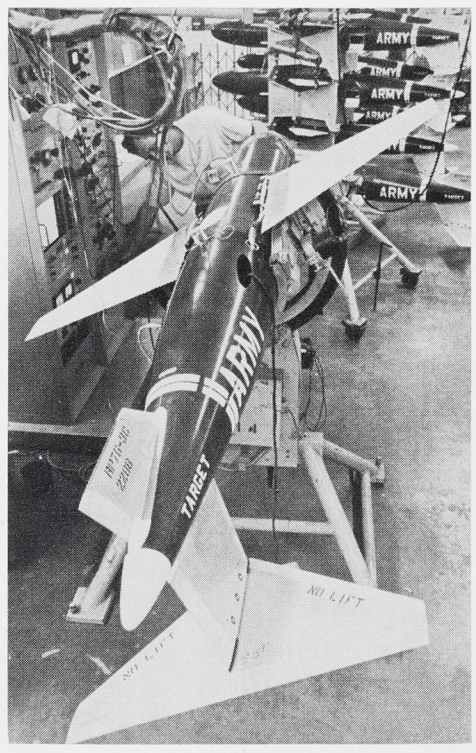
"The reliability and failure data reporting program established for the T-38 program was the first to provide an accurate system of reporting GFAE failures. The reports from the T-38 program have received considerable attention and have stimulated numerous surveys in an effort to understand, define and establish

(See RELIABILITY, page 8)

AQM-38A IS QUEEN OF DRONE LINE







Assembly of AQM-38A (RP-76) drones at Northrop Ventura requires careful attention to torque settings of eccentrics which provide proper dihedral for wings. After that, permanent wing bolts are installed. In left photo, detail assemblers Mike Reichert, left, and John Baker adjust wing position. In second photo, Neil E. Ward, test technician, left, and Leon Barnes, detail assembler, lower target drone into test fixture for complete preflight electrical checkout. Last photo shows Mr. Ward performing the operational test of such electrical equipment as receivers, transmitters, gyros and antennas. This particular bird contains destruct system, which was also electrically tested, although a parachute recovery system is included in many of the AQM-38As built at Ventura. Final assembly of the drone, produced under a current Army contract, will continue through January.

Sutter to Direct Expanding Activity Of Page Marketing

Walter E. Sutter has been elected vice president and senior director of Marketing at Page Communications Engineers. The announcement was made by Joseph A. Waldschmitt, Page president, who indicated the Northrop subsidiary is expanding its marketing organization further in the commercial and international areas after years of successful systems management for the U.S. Department of Defense.

Mr. Sutter served in his previous association with the General Electric Company in the fields of communications and computers as manager, Telecommunication Sales and Service, Communication Products department; manager, Product and Systems Sales, Communication Products department; and, most recently, manager, Defense Sales, Computer department.

LSV Study Updated By Sponsler Paper

William B. Sponsler, member of the technical staff at Northrop Space Laboratories, will present a paper on preliminary mobility tests of a scale model lunar roving vehicle January 14 at the 1966 Automotive Engineering Congress and Exposition in Detroit.

Mr. Sponsler is inventor of the system — described as "walking beam suspension" — for Northrop's lunar surface vehicle.

United Crusade Presents Awards

United Crusade's Outstanding Service Award has been presented a team of volunteers, including 10 from Northrop, that has done an outstanding job in raising funds for the annual charity drive.

The team comprises the Commerce and Industry Division in the Southwest Area, the first group to exceed its goal in the area.

Welko Gasich, Norair vice president and assistant general manager-Technical is the vice chairman. Team members include Fred Anderson, Hank Clark, Charlie Eyres, John Fisher, Clay Fullenwider, Gordie Gmur, Ralph Jenney, Don Kohler and Bill Steen of Norair.

Also recognized for outstanding service was Norair's Marvin "Red" Beyrodt, a United Crusade loan executive, who accounted for 60 percent of total funds pledged in the area for this division.

Harold Page, liaison engineer, holds check for $515 he has just received from Welko Gasich, Norair vice president and assistant general manager-Technical.

ENGINEER POCKETS $515; NEW TREND IN AWARDS SEEN

Harold W. Page, a Northrop Norair liaison engineer, has pocketed a check for $515 from the Norair Suggestion Award Plan.

His award is one of the largest presented this year and ranks as tops among Engineering personnel for the past few years. However, Suggestion Award administrators report a growing number of suggestions are being processed each week from Technical personnel, marking the beginning of what could be a new trend, and that Mr. Page's top spot may be in jeopardy.

Mr. Page came up with an improved method for repairing slightly damaged F-5 and T-38 windshield and canopy glass.

Previously, damaged canopy assemblies were removed at Palmdale and returned to the factory, via Mariposa. Glass was removed and shipped to the vendor for repairs. Disregarding elapsed time, this method involved 29 steps and consumed about 19 manhours for handling, packaging, routing, repairs and tests. The cost ran to about $350 per item.

Mr. Page suggested a qualified technician be sent from the vendor's establishment to make repairs at Palmdale. In the first six months of 1965 the vendor made five trips at an average cost of $125 per trip and reworked 12 damaged glasses.

The annual savings (net) from Mr. Page's suggestion is expected to be around $5147.

Welko Gasich, Northrop vice president and assistant general manager—Technical, presented the Suggestion Award check to Mr. Page and added his personal thanks for his thinking, ingenuity and support.

Busy Schedules Mapped for Lifting Body Research Vehicles Produced for NASA

Busy schedules are being mapped for the two lifting body research vehicles, the M2-F2 and HL-10, produced by Northrop Norair for the National Aeronautics and Space Administration (NASA).

Initial manned captive flight of the M2-F2 is now pending at NASA's Flight Research Center, Edwards, California.

And at Northrop Norair the HL-10 is moving through final stages of assembly in preparation for a mid-January delivery date.

Both vehicles will be utilized by NASA in studies that could lead to the next big step forward in the art of returning manned vehicles from space. These wingless, wedge-shaped vehicles promise a major advantage over reentry vehicles currently in use in manned space projects—they are capable of gliding to controlled landings at a selected site.

NASA's Office of Advanced Research and Technology has primary responsibility for the lifting body research vehicle program. Ames and Langley Research Centers established basic configurations for the M2-F2 and HL-10 respectively, while Flight Research Center is coordinating the over-all program. Paul Bikle is Flight Research Center director with John McTigue serving as M2-F2/HL-10 program manager.

Northrop's efforts are guided by Manager Dr. L. R. Fowell; R. C. Hakes, director; L. W. Klauer, Engineering chief; and R. H. Thornhill, Manufacturing chief.

Northrop Norair delivered the M2-F2 to NASA in June. It was trucked to the Flight Research Center for final instrumentation then sent to Ames Research Center for a full-scale 100-hour wind tunnel test program to verify aerodynamic characteristics.

Since early September the M2-F2 has moved steadily toward its first manned captive flight test at Flight Research Center.

Minor changes, crew familiarization, systems checkout and calibration efforts have been carried out. A major activity has been the mating of the M2-F2, via an adaptor produced by Norair for the program, to the pylon assembly below the wing of a B-52 mother ship. Recently, a series of high-speed taxi and low altitude flight tests were conducted with the M2-F2 in place aboard the B-52.

Solo taxi runs were carried out on the M2-F2 December 7. Two runs were made with Milton Thompson, chief program pilot for NASA, and Captain Jerauld Gentry, USAF, alternating at the controls.

The M2-F2's two regular hydrogen peroxide rocket engines, used to provide an increased lift/drag ratio during critical approach and flare, were augmented by the installation of two additional engines of the same type. Total thrust, controlled by throttles, was 2000 pounds for this test operation.

Mr. Thompson will be in the cockpit when the M2-F2 makes its first captive flight test aboard the B-52. Plans call for a climb to about 45,000 feet. Of special interest will be the dynamics of the vehicle-adaptor-pylon combination in flight, buffeting incurred and in-flight operation of all controls and landing gear.

Flight test schedules at Edwards Air Force Base are very much dependent on weather. The "dry" lake bed has recently been more suitable for water skiing.

Meanwhile, the HL-10 is in the midst of systems installation and final assembly operations. It was removed from its assembly fixture in late October. Included in the extensive test program planned prior to delivery in January is a drop test of the vehicle, loaded to 8000 pounds gross weight.

This test effort, to be carried out in the Engineering Test Laboratories, will find the HL-10 simulating a landing vertical velocity of 13 feet per second. Thorough structural inspection and functional systems checkout will follow.

The route the HL-10 will follow toward its first flight will parallel that of the M2-F2. It will go to Flight Research Center, **(See LIFTING BODIES, page 8)**

MEETINGS

TEAMS, Super Sensor Discussed at MAECON

The DATICO/TEAMS concept of automatic test equipment and an electronic sensor that surpasses the state-of-the-art were described by two Northrop Nortronics engineers last month at the Mid America Electronics Conference (MAECON) in Kansas City, Missouri.

Donald R. Behrens and Robert L. Werth of Automation Systems section at Anaheim presented the papers.

The TEAMS (Test Evaluation and Monitor System) concept, newest in the eight-year history of DATICO applications, was created to provide an integrated organized approach to the performance monitoring of multiple systems at minimum total costs, Mr. Behrens said.

Total costs are minimized by simplification of procedures, formats, equipment design, programming, and documentation.

Most significant in the TEAMS concept, however, Mr. Behrens said, is the development of a general test procedure and a general test format which can be repeated on all tests of all systems through standardization.

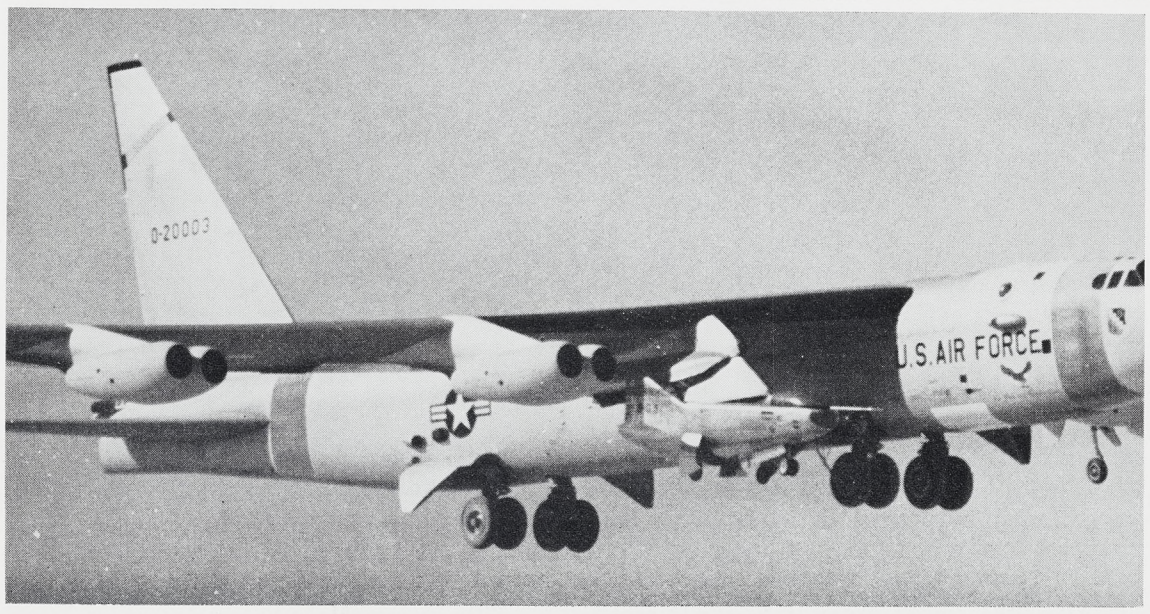
In describing the gap which the latest developments in Nortronics automatic test equipment fills, Mr. Behrens said "the growth of electronic systems in numbers and complexity without comparable growth in standardization of test methods and their mechanization has created a severe performance evaluation and maintenance problem for the user."

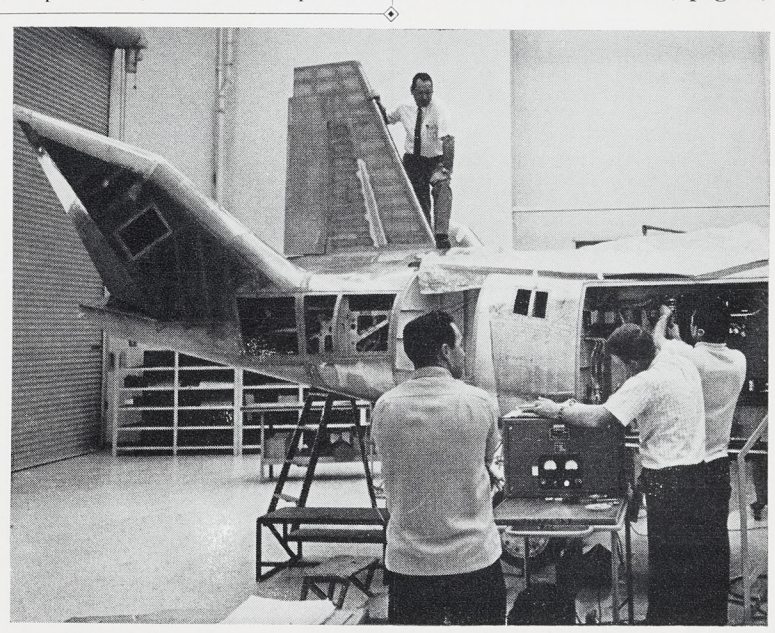
Mr. Werth, developer of an automatic pulse analyzer, told the MAECON conference that the instrument uses state-of-the-art components and circuit design to extend the existing ranges of pulse (waveform) measurement.

"Automatic testing of missiles, packages, and subsystems has resulted in an urgent need for a programmable measurement instrument to evaluate dynamic waveform parameters," he said. "Most systems have achieved high measurement accuracy in the areas of voltage and frequency but the scarcity of programmable dynamic measurement equipment led to the development of a pulse analyzer."

The instrument surpasses the oscilloscope in accuracy and reliability while reducing the measurement time from minutes to milliseconds.

The use of the pulse analyzer, either in the field of missile and weapon system checkout or on the manufacturing line, will reduce test time by a factor of 1000 while giving test results that are free from operator interpretation, Mr. Werth explained.





B-52 TAKES OFF FROM EDWARDS AIR FORCE BASE WITH M2-F2 LIFTING BODY RESEARCH VEHICLE UNDER ITS WING, WHILE FINAL CHECKOUT OF HL-10 IS UNDER WAY AT HAWTHORNE.

Classified

For Sale

Bedroom Set, modern, bookcase headboard, 2 night stands, triple-dresser w/mirror, chest, dbl. bed, $65. Inglewood, OR 3-1189. A

Professional Printing Press, hand-operated, postcard size, complete w/several sets of type in special cabinet, suitable for ambitious youngster or for professional use, $125. Inglewood, PL 6-7681. A

Ice Skates, boy's size 3, CCM figure-type, $20. No. Corona, 735-1232. A

Corvair, Monza coupe, 1962, $1095. Hawthorne, 675-0549. A

Myna Bird & cage, very tame, large vocabulary, $75. Hawthorne, 371-5822. A

Exerciser, electric upright, $15. Hawthorne, OS 6-3886. A

Furnishings, coffee tables, several, from $7-$25. L.A., 476-1635. A

House, 4-bdrm, family room, 2½ baths, 1 acre, horses OK, near Northrop Ventura, $35,000. Somis, 805—482-1186. A

VW sunroof, 1963, windshield washers, heater, $1200. Long Bch., 596-1280. A

Camera, Tower 35mm auto., built in flash, F3.8 lens, $15. Hawthorne, 676-6122. A

Accordion, 120-bass, $75. Downey, TO 9-2673.

Camera, 3¼ x 4¼ Speed Graphic press w/ Polaroid back, $75. Orange, 714—KE 2-1232.

Power Lawnmower, 20″ Trimmer, reel-type, Briggs & Stratton eng., full span reel, front catcher, $75. Rolling Hills, 831-9707. A

DKW, 4-dr., $55. Brea, 529-3531. A

Pole Planter, 9-plant, $15. Brea, 714—529-1436. A

Shotgun, Browning, over & under, semi trap gun, full & modified choke, 12 ga., $250. Buena Pk., LA 1-4711. A

Go-Kart, original, foam rubber/black vinyl seat, 2½ hp Clinton eng., chain drive, $125. Hawthorne, OS 5-9500. A

Car Radio for 1949-1950 Chevrolet, $10. Lawndale, 371-0194. A

Winchester, model 70, caliber 220 Swift, w/ 8-power scope, $150. Hawthorne, OS 9-7123.

VW Variant station wagon, 1965, 1500 series, belts, radio, vents, w/s/w, 10,000 miles, $2300. Hollywood, OL 6-3475. A

Stereo hi-fi components, AM/FM tuner, dual amplifiers, dual preamps, 4 speakers, dual cross-overs, stereo turntable, $66. Hawthorne, 676-0418. A

Pups, basset, AKC reg., shots, whelped, $75. Tarzana, 344-3644. A

Organ, Baldwin model 40 Orga-Sonic w/percussion, Philippine mahogany w/matching bench, 2 keyboards, 2 octaves of base pedals, $695. Redondo Bch., FR 5-3914. A

Ford, 1957, 6-cyl., auto trans., $250. Box 2201. A

Range, elec., Westinghouse, coppertone, 4-burner, auto. oven & timer, $175. Gardena, 324-0274. A

Outboard Motor, Johnson, 1953 10 hp, 5 gal. fuel tank, complete o/haul, $85. Hawthorne, 675-2953. A

Duo Bed, 2 cot-type beds in compact unit, 2 innerspring mattresses, $25. San Pedro, TE 3-6814. A

Cabin Cruiser, 27′ Chriscraft sedan, sleeps 4, planked hull, V-8 power, ship to shore radio, completely equipped, $5500. Torrance, DA 9-3900. A

MG TD, 1953 classic, $650. Lomita, 325-1407.

Refrigerator, Philco, 12 cu. ft., large freezer, defrost, $100. Hawthorne, OS 9-2875, 370-2125. A

Glasspar custom sunliner, 1964, 18′ LOA, 120 hp Mercruiser, access., American trailer, $2995. Palmdale, TO 2-8014. A

Surfboard, Bing, 9′4″, $85. Lynwood, 632-2642. A

TV, 24″ RCA, modern birch cabinet, new picture tube, w/complete set of spare tubes, $100. Lomita, DA 6-6214. A

Corvair, 1961, Lakewood station wagon, auto. trans., r/h, $795. Venice, EX 1-2040. A

Motor Scooter, Cushman, new tires, body needs work, $65. Garden Grove, LE 9-5812. A

MGA, 1958, new paint & top, wire wheels, $600. Inglewood, PL 8-9825. A

Phonograph, 1966 model, AM/FM stereo, $125. Box 2202. A

Cemetery Lots, dble. interment, Inglewood Park, El Portal sec., $800 lot. P.V. Pen., 377-1180. A

Bedroom Chests, 3 white contemp., 5-drwr., 3-piece corner sectional w/3-drwrs. each, gold and white legs, $200. Inglewood, 677-7608. A

Piano, Hallet & Davis spinet, mahogany, $350. Torrance, DA 6-7232. A

Dodge, 1964, 4-spd., G.T., $1750. Lakewood, 422-3368. A

Pickup, 1956 Ford custom cab, ½-ton, w/ 1959 rebuilt eng., Fordamatic trans., new paint, good tires, $650. Lynwood, 631-3459. A

Plymouth, Plaza, 1957, 2-dr. sedan, 6-cyl., stick shift, 45,000 miles, r/h, $250. L.A., 752-5687. A

For Sale

Bicycle, boy's Schwinn Stingray, $30. Torrance, FA 8-2852. A

Stove, O'Keefe & Merritt, 35″, $50. Gardena, 327-2279. A

Refrigerator, Servel, $40. Hermosa Bch., FR 9-7342. A

TR 3 Triumph, 1962, r/h, $850. Torrance, 326-2296. A

Motor Scooter, 1962, Zundapp Bella, 12 hp eng., less than 1200 orig. miles, $275. Hawthorne, OS 5-6831. A

Surfboard, Jacobs, 9′3″, 3 redwood stripes, $50. Torrance, 375-9657. A

Corvair Monza coupe, 1961, bucket seats, seat belts, 4-spd. trans., w/s/w, r/h, $850. Inglewood, 678-5846. A

Mercury Montclair, 1955, 4-dr. r/h, w/s/w tires, 57,000 miles, 1-owner, $200. Inglewood, 671-4986. A

Camera, Canonette 35 mm. auto. or manual, F1.9 lens, 1 sec. to 1/500 w/case & filter, $55. L.A., EX 7-2872. A

Kittens, Siamese, seal points, 8-wks-old, no papers, $15. Anaheim, 776-8785. A

Yamaha, 1964, 80 c.c., $225. Torrance, 328-7870. A

Ford, 1940, V-8 deluxe coupe, needs paint & upholstering, $150. Inglewood, PL 6-1812. A

Camping Trailer, 1963 model, 12′, sleeps 4, complete w/stove & oven, $750. L.A., 757-3595. A

Chevelle, 1965, 2-dr. station wagon, used 4 months, $3000. Hawthorne, OS 6-7542. A

Organ, Thomas electronic transistorized, ebony, matching bench, 2 keyboards, 25′ pedals, Leslie speakers plus 3-12″ speakers, fluorescent music rack light, chimes, percussion, many extras, 3 yrs. guaranty on the tone generators, $1300. Hawthorne, 679-4365.

Organ, Hammond, spinet w/extras, $850. Gardena, DA 4-3666. A

Typewriter, 1957 Smith-Corona standard, rebuilt, legal-size carriage, magic margins & tabs, $65. L.A., 293-7922. A

Mobile Home, 12′x60′, 2-bdrm., furn., or unfurn., antique white int., white & gold ext., 50′ awning, carport, skirts & shed, $1800 equity & take over $92.50 mo. payments or $6000. Torrance, 370-4101. A

VW 1200 sedan, 1965, many extras, 8000 miles, $1650. L.A., 474-9790. A

Communications Receiver, Collins 75S-3, new condition w/full crystals, $425. El Segundo, 322-6655. A

Train, Lionel, elec., $12. Torrance, FR 9-5690.

Drafting Machine, Bruning, 18″ metal & 10″ plastic scales, $90. San Pedro, TE 3-9696. A

Chevrolet Impala, 1963, SS coupe, air cond., p/s, 39,000 miles, orig. owner, $1850. L.A., 876-8395. A

Home, 3-bdrm., view, built-ins, fireplace, sprinklers, 1½ bath, 5-yrs-old, newly redec., $24,500. FR 6-6364. A

Stamps, 1 book of 1st covers, (first day of issue), 2 books of stamps comp. w/foreign & world wide, $75. Rolling Hills Ests., AD 4-2878. A

VW Variant 1500S, 1965, sq. back sedan, wagon, 5000 miles, $2275. Inglewood, OR 1-8694. A

International Travelall C110, 1963, 304 V-8, 5-spd., h-d trans., air cond., r/h, powerloc, tach., easy lift hitch, extra 6-ply tires, 21,000 miles, $2295. P. V., 377-1075. A

Train Set, American Flyer, elec., incls. engine, tender & 3 cars, transformer & track, $10. Fullerton, 526-4275. A

Chevrolet station wagon, 1957, auto. trans., r/h, p/b, p/s, w/s/w, air cond., $550. Torrance 323-2074. A

Bicycle, Stingray, still in packing crate, $31.50. Gardena, DA 4-4507. A

Organ, Thomas electronic, single keyboard, bass pedals, voice controls, $175. Fullerton, LA 6-2071. A

Chevrolet, 1953 convt., stick shift, good top, tires, brakes, $195. Torrance, 327-4585. A

Coat w/belt, pink naugahyde, size 14, $25. Hawthorne, OS 6-7082. A

Ford station wagon, 1955, 6-pass., r/h, $100. Hawthorne, 644-3162. A

Bicycle, boy's 24″, $15. Manhattan Bch., FR 5-5097. A

Washer, Kenmore DeLux auto., w/dryer, Wedgewood, gas, $85 or separately. Rolling Hills, FR 5-5036. A

Clothing, boy's, sizes 10-16, suits, jackets, coats, shirts, $50. Chatsworth, 882-0761. A

Mobile Home, Roadcraft, 50′, 8′x35′ cabana, steel storage room, awnings, carport, $4000. Gardena, 329-5879. A

Wire Wheels, 2 19″, suitable for MG PA, MG J2, MG TC, $10 ea. Torrance, 375-0449. A

Ford coupe, 1948, 1963 Chevrolet 283 eng., new black tuck & roll, completely restored, vibrasonic radio & many extras, Torrance, FR 8-1350. A

Ford, 1956, 2-dr. Victoria, T-Bird V-8 eng., auto. trans., $295. San Pedro, TE 1-2654. A

House, 2-bdrm., fireplace, double garage, $21,750. Inglewood, OR 1-3860. A

Typewriter, Smith Corona, portable, 3-yr-old, $35. P.V., 377-8259. A

For Sale

Bed, twin-size, w/collapsible trundle bed & mattress, $75. Torrance, DA 4-7601. A

House, 4-bdrm, built-ins, near new, $36,500. Torrance, 327-2666. A

Chevrolet, 1957, mag. astro rims & Casler cheaters slicks, bucket seats, new trans. & front end, $750. Torrance, 378-5924. A

Trampoline, 6′x10′ folding-type, $65. Inglewood, 757-6960. A

Ford, 1959 station wagon, r/h, good tires, runs good, $425. Box 2203. A

Austin, 1959, Cambrian model, 4-dr. sedan, bucket seats, 4-spd., low miles, $350. Gardena, 327-0662. A

House, 2-bdrm, custom inside, panelled kitchenette, covered patio, 2-car gar., 15′x35′ filtered & heated pool, Alcoa aluminum siding, cor. lot, $23,500. Lakewood, HA 5-6844.

Wet Suit, hvy. duty, hood, top, bottom, 40-42, fins, flipper slippers, mask w/exhal. valve, $50. Torrance, 323-4257. A

VW 1500 S, 1964, sedan, 66 hp, $1850. Lynwood, 638-4954. A

Buick Le Sabre, 1963, 4-dr. h/top, factory air, auto. trans., p/s, p/b, r/h, $1895. P.V., 378-9741. A

VD sedan, 1963, 23,000 miles, $1300. Box 2204. A

Desk, black walnut finish, exec. style, $45. Box 2205. A

Land, 10 acres near Rosamond, $595 acre w/ terms, Torrance, FR 8-1026. A

Engagement Ring, exceeding ½ karat blue-white diamond w/matching wedding band, $175. El Segundo, OW 1-0134. A

Pontiac Bonneville sta. wag., 1960, auto. trans., p/s, p/b, p/seats, p/windows, 48,000 miles, new tires & brakes, $1100. Orange, 714-633-4378. A

Ford, 1958, 4-dr., new battery, smog device inst., $250. Torrance, 371-8564. A

TV, combination, 21″, radio & record player, red mahogany cabinet, new picture tube, $100. Rolling Hills Ests., DA 5-5609. A

Train Set, 3 eng., 11 cars, 2 mechanized, 125 watt transformer, 3 bldgs., 1 tunnel, other misc. accessories, $65. Long Bch., GA 3-1363. A

Tires, 4 6.70 x 15 b/w, $40. Torrance, 323-1936. A

Surfboard, 9′6″ Jacobs, yellow pigment deck, $45. Rolling Hills, FR 7-3552. A

House, 2-bdrm., on R-2 lot, h/wood floors, interior recently painted, patio w/built-in barbeque, consider lease w/option to buy, $16,000. Torrance, FR 1-0629. A

Stereo-Pak, Muntz, 12 volt car., 3 tapes, 3-mos.-old, chrome ext., $50. No. Hollywood, 764-7131. A

Chevrolet, 1958, 3-spd. trans., chrome rear wheels, r/h, ¾ racing cams, new shocks, tires, front end rebuilt, $800. Torrance, 328-6277. A

Television, Packard Bell, 17″ screen, blonde console, $50. Torrance, DA 3-8797. A

Refrigerator, Coldspot, 12 cu. ft. freezer across top, $75. Gardena, 644-1485. A

Corvette, 1958, 3-spd. trans., new tires, $1200. Torrance, 329-7446. A

Mercury Comet, 1965, 2-dr. sports, 2200 miles, p/s, p/b, bucket seats, air cond., $2600. Inglewood, 674-5579. A

Hi-Fi Console, Packard-Bell, 4-spd. record changer, AM/FM radio, 3 speakers, mahogany cabinet, $50. Hawthorne, 676-2801. A

VW sedan, 1965, 9300 mi., $1575. Redondo Bch., 372-7390. A

Trundle Bed set, cot-size, innersprings, $15. Costa Mesa, 549-1760. A

Thunderbird, 1960, h/top, new paint, tires & battery, full power inc. seat, $945. Box 2206.

Wanted to Buy

Bicycle, good used 10-spd. Derailleur. Hawthorne, 676-5464. B

Encyclopedia, World Book, complete. L.A., 472-2031. B

For Trade

Tire, 525-550x17, trade for 750x14, white wall. L.A., AX 2-4958. C

Pontiac Tempest, 1965, 2-dr. sport coupe, 250 hp eng., p/s, radio, trade for smaller car. P.V. Pen., 377-5172. C

Luggage Carrier, Sears cartop model, 72x48x 14, waterproof plastic-fabric, full length zipper access, will trade for carrier of smaller size. Hawthorne, 675-9557. C

FREE (To Be Given Away)

Pup, 11-wks.-old, mixed breed. L.A., VE 7-9813. D

Rentals Offered

Studio Apt, 3-bdrm, 2-bath, pvt. patio, closed gar., soundproofed, hot water & trash pd., near schools, park & bus line, $175 mo., Torrance, FR 5-0867. E

Apt, 3-bdrm., $130 mo. Gardena, 324-6277. E

Apt, 1 & 2 bdrm., furn. & unfurn., soundproofed, all electric, closed gar., some w/ small fenced yard, 10 minutes to Nortronics PV, close to schools, churches, playground, $75-145. Torrance, 375-9397, 375-2091. E

Rentals Offered

House, furn., 2-bdrm., double garage, $125 mo. Gardena, DA 4-7688. E

Bachelor Apt, 1-bdrm., furn., fireplace, garage, utilities, 3 min. from ocean, $110 mo. Hermosa Bch., 372-5985. E

Engineer has furn. 2-bdrm. apt. to share, convenient to Norair, occupancy around mid-Dec., $100 mo. & utilities. Inglewood, 674-1634. E

Apt, 2-bdrm, redecorated, pool, child OK, W. L.A. area, $125. L.A., VE 7-4036. E

Cabin, Idyllwild, sleeps up to 6, fireplace, stream, patio, $20 weekend, $50 wk. Inglewood, PL 4-5288. E

Apt, 1-bdrm, unfurn., ½ block to ocean, garage, $90 mo. Redondo Bch., FR 5-8938. E

Apt, 2 2-bdrm units, upper & lower, & bachelor unit, built-ins & stoves, 2 blks. to Norair, $110 & $95 mo. Hawthorne, OS 6-7417. E

Apt, 1-bdrm, upstairs, built-in stove, laundry facilities, $89. Gardena, 328-6655. E

House, 1-bdrm., small, furn., lge. encl. yard, tiled shower, $90 mo. Inglewood, OR 2-5852, OR 1-2097. A

Apt., 3-bdrm., furn. or unfurn., gar. avail., children OK, $115-$135 mo. San Pedro, TE 1-3737. E

House, 1-bdrm., unfurn., h/wood floors, 220-v elec., 3 miles from Northrop, $65 mo. Hawthorne, 676-5565. E

Personals

Tap Dancing lessons for children, private or class. Gardena, 675-1005. L

Rider wanted to share driving to Boston, Massachusetts. Leaving about January 8. San Pedro, 831-6462. L

Share home w/single woman or working mother. 3-bdrm., 2-bath, lge. fenced yard, fireplace, near parks & school, 5 minutes from Norair. Gardena, 323-3245. L

We appreciate so very much the kindness & understanding shown by our many friends at Northrop in the recent sad weeks. JERRY SMITH & FAMILY.

For Sale or Trade

Couch & chair, studio-type, $25 or trade for 2 occasional chairs in good condition. Hawthorne, 644-2440. M

Multiple Renault parts, $50 or trade for 10-spd. near new bicycle. Torrance, DA 6-5558.

Condominium Apt, 4-bdrm, 2½ bath, 2-car det. garage, pool, clubhouse, 1-yr-old, $30,500, 10% dn., will trade for Hollypark home. Torrance, 327-3160. M

Going my way?

Rides Wanted

7 a.m. — 3:45 p.m.

Main St. & 234th, Wilmington. Maie Robinson, Norair, ext. 2004, TE 4-8352. 2

8 a.m. — 4:45 p.m.

Orange Ave. & Del Amo, Long Beach. W. T. Covert, NSL, ext. 2721, GA 3-1363. 5

Rides Offered

8 a.m. — 4:45 p.m.

Orange Ave. & Del Amo, Long Beach. W. T. Covert, NSL, ext. 2721, GA 3-1363. 15

PHILIPPINES

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structors in the F-5 maintenance school at Basa.

Charles T. "Chuck" Weaver is the Northrop Field Service technical representative assigned at Basa Air Base to provide technical advice and assistance to the PAF on operation and maintenance of the F-5s.

RELIABILITY

(Continued from Page 6)

corrective programs for both the equipment involved and the reporting procedure."

Basic concepts of the program were introduced in early 1959 and carried out during developmental testing and later customer testing of the T-38, primarily at Randolph AFB, Texas.

The F-5 reliability demonstration recently concluded was carried out during actual combat crew training missions being flown at Williams AFB, Arizona.

In the most simple terms, the F-5 program called for Northrop to contractually commit to the meeting of exacting reliability goals and requirements, and to the development and implementation of a management plan for assuring the achievement of these requirements.

The reliability program plan identified management responsibilities for reliability goals and requirements. Management control was afforded by periodic status reports. These included reliability predictions, measurements from tests, status of reliability attainment tasks, current reliability problems, failure corrective action, and a comparison of indicated reliability with established goals.

For the F-5 fighter the reliability index established for measurement was mission reliability. It is the probability of a two-hour composite tactical mission being carried out without failures. A failure is anything that would prevent accomplishment of any objective of the mission—a leaking landing gear strut and failure to fire 90 percent of gun rounds carried. A mission begins with the arrival of the aircrew and ends with engine shutdown following flight.

A special monitoring team, composed of representatives of Tactical Air Command, Northrop Norair and General Electric, checked and double-checked every factor involved.

LIFTING BODIES

(Continued from Page 7)

then to Ames Research Center for a 100-hour wind tunnel test program. Upon return to Flight Research Center, it will undergo similar preparations for flight.

In addition, Northrop is supporting NASA efforts, as needed, by supplying technicians and special personnel under a separate contract. Ralph Allen is currently on duty at Flight Research Center as a Northrop technical representative. Other personnel are sent there as required and requested.

PERFECT PERFORMANCE PROGRESS—The 24 members of the Product Support department Technical Art branch pose proudly with their Zero Defects Perfect Performance chart. Through their enthusiastic support of the ZD effort, this group has achieved their initially established goal a full five months ahead of schedule.